

What Will Happen to ARDC—Now? p. 1

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July 28, 1958

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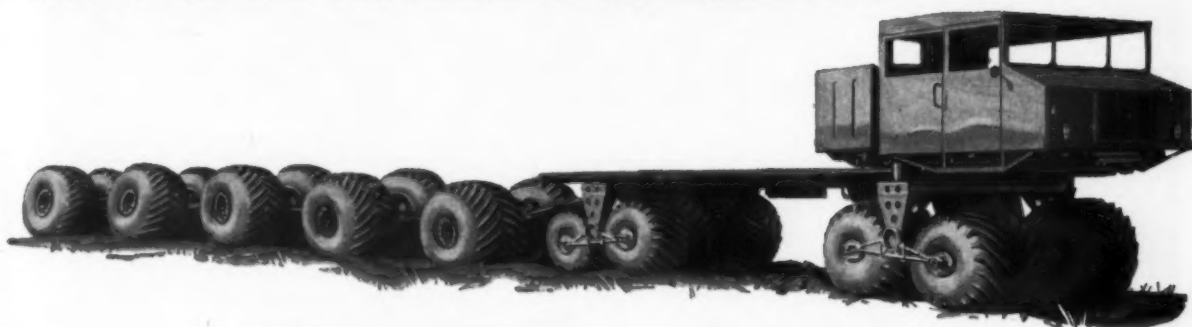
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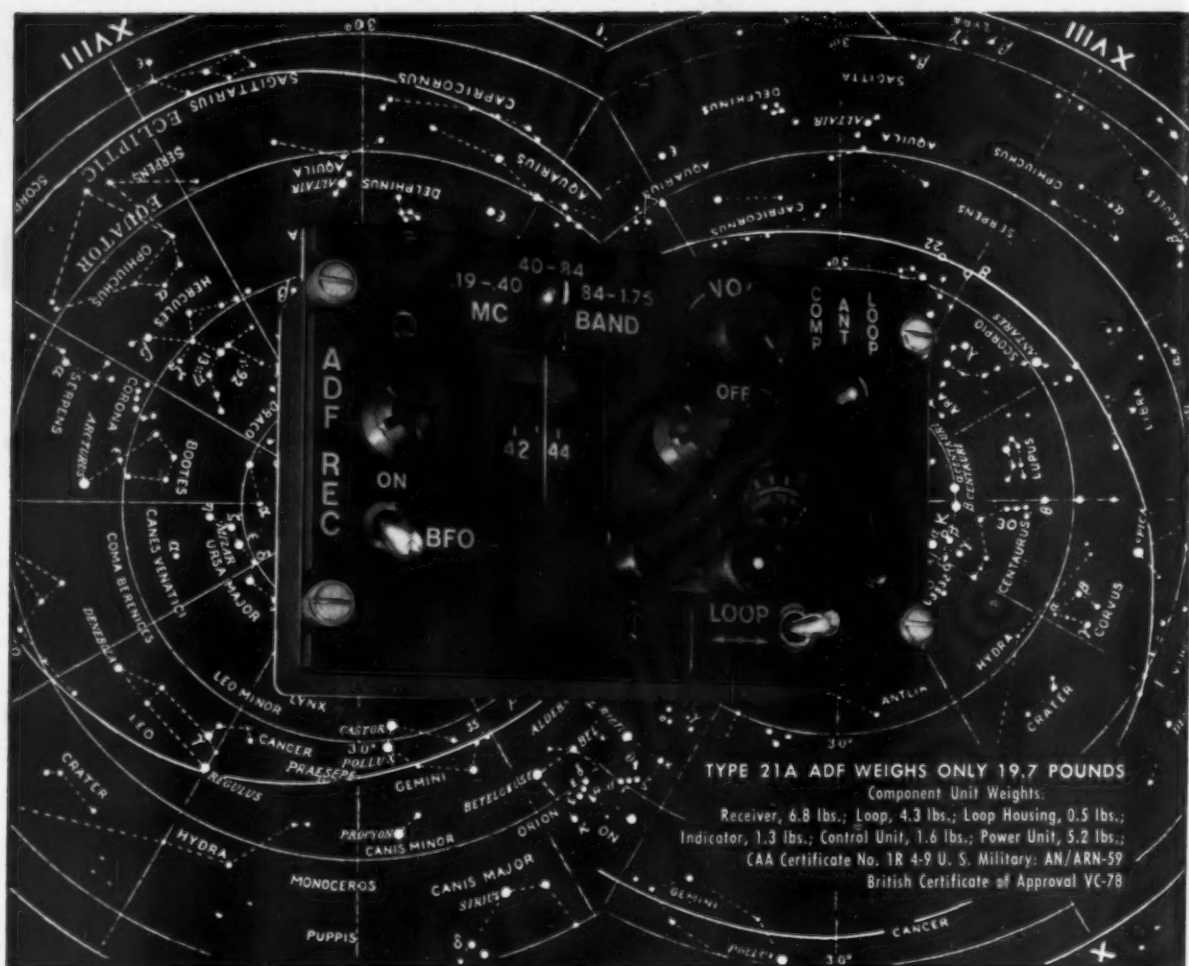
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AMERICAN AVIATION

JULY 28, 1958—VOL. 22, No. 5

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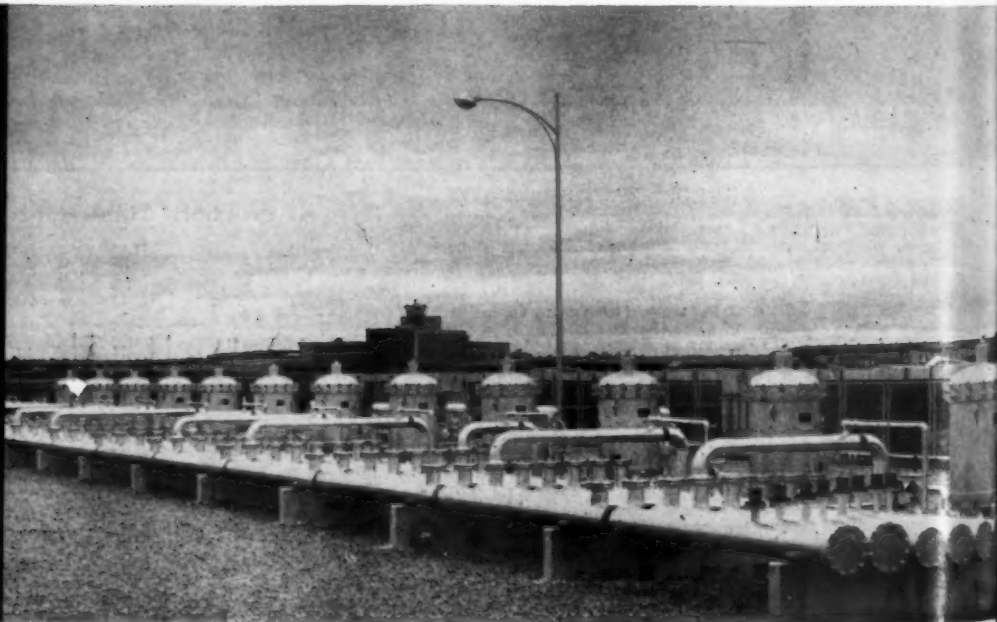
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USAF Comes Through

There is good news from the Air Force. It is going to use private contractors for maintenance and overhaul on a substantial scale this year.

Less than a year ago there were plans to eliminate private industry entirely and to build up USAF depots even more. We referred to this blackout as a trend toward "peoples' factories".

But thanks to three men, especially, USAF has reversed the earlier plans and a rapidly deteriorating industry will be revived. Credit and cheers go to Lt. Gen. C. S. "Bill" Irvine, Deputy Chief of Staff, Materiel; to General Ed Rawlings, Chief, Air Materiel Command; and to Maj. Gen. Al Hewitt, Director of Maintenance Engineering.

The Army is committed to use private industry also, but the Navy is still a complete blackout, insisting that private contractors cannot measure up to Navy requirements. Congress has taken quite a deep interest, but the outcome with the Navy is still in doubt. We hope Navy will show its good faith in American enterprise by using the skills of private industry to greatest extent possible.

Another Six for Gurney

With unprecedented dispatch, the President reappointed and the Senate speedily confirmed Chan Gurney for another six-year term on the Civil Aeronautics Board effective next January.

This is good. Chan Gurney has been one of the best CAB members since that agency was created twenty years ago. He is hard-working, conscientious, and practical. He has a mind of his own and hangs on nobody's coattails. The early and swift action on reappointment is in itself a high tribute. It is very good news indeed that the former Senator from South Dakota will be around for another full term.

Orchids

The things that men do wrong, or the things that men don't do that they should be doing, most often get top attention in conversation and in print, especially editorials.

A report is overdue on three important government jobs which we believe are being well done.

First is Presidential Assistant Elwood "Pete" Quesada, who is confounding all of the skeptics and critics by turning in a terrific performance by all of the usual standards of measurement. He is carrying a dual load—Airways Modernization Board and Presidential Aide—with bustling dispatch and sound judgment.

Second is CAA Administrator Jim Pyle, who inherited a mass of problems and a laggard organization. With workloads and headaches worse than ever, he has

proved to be a nimble, able administrator not afraid to make decisions and not afraid to stick out his neck. Only in the international field, where he inherited an exceptionally bad situation, has he failed to produce solid results to date.

Third is George Borsari, who took over a few months ago the hefty task of heading up the CAA Airports Division—a bigger and more important job than the title would imply. What was needed here was an ability to organize, to make decisions and to get things moving. Borsari is doing all of this.

It is an all-too-common practice in government to postpone decisions, buck a problem to another office, find some excuse for not making a decision that might make somebody unhappy, and to hope that if a problem hangs around long enough it will just disappear. Decision-making is one of the most vital keys to good administration. Whether or not everybody likes what Messrs. Quesada, Pyle or Borsari are doing, these men deserve the highest tribute for moving ahead and making decisions.

Dr. Warner

It was a shock to read of the death of Dr. Edward P. Warner, 63, on July 12. Here was a man who contributed a very great deal to aviation in the United States and throughout the world but who never really received in his lifetime the recognition and rewards due him. It can be said with some truth that he was more highly regarded, more highly respected, and more highly honored abroad than in his home country, although we are sure that had he lived another ten years the just rewards would have been forthcoming from the U.S.

His was the penalty of making his contribution since 1945 outside of the United States. During this period he was the key spirit and the key driving force and the leadership of the International Civil Aviation Organization in Montreal. The old trite saying "Out of sight, out of mind" is somewhat applicable, although not to the credit of U.S. civil aviation which should have kept him more in the limelight. Dr. Warner's entire lifetime was devoted completely to aviation; it was a life well spent and the world is the better for it.

There's the T34, Too

In awarding a bouquet to Allison Division of General Motors for its praiseworthy turboprop engine, the 501 D13 which is on the Lockheed Electra (June 16 issue), we wrote as though this was the only turboprop in the U.S. aircraft engine stable. Not so, of course, for Pratt & Whitney's T34 turboprop has been around for quite a spell and is doing very well indeed on the Douglas C-133. Full credit remains for Allison, but P&W's turboprop certainly shouldn't be overlooked.

Wayne W. Parish

LETTERS

Defender of Seaplanes

It is sincerely hoped that few people concur with the "name withheld" gentlemen who severely criticized seaplanes in a letter printed in your May 19 issue. Certainly, his conclusion cannot be based upon the use of modern water-based airplanes incorporating latest advancements in the state of the art.

Modern water-based airplanes do not resemble so-called "conventional flying boats" of the past. The use of jet engines makes possible the design of compact, close-to-the-water seaplanes having no greater drag than high-performance landplanes. There are no longer any requirements for mounting engines high above the water to provide propeller clearances of waves and spray, which, of course, led to the bulky, quite heavy, high drag boat hulls of past seaplanes.

Hulls, as such, with rugged and heavy keels, chines and bottom plating are no longer necessary either. Rather, small and efficient, highly-loaded, fully retractable hydro-ski alighting gears can be employed which blend smoothly into aerodynamically-clean landplane-type fuselages. Use of these alighting gears has reduced the structural weight penalty for water-basing to zero. Thus, modern water-based airplanes can be designed to accomplish the same missions as landplanes have equal performance.

Now that water-based airplanes have a new lease on life, it is vital to support their research and development and to exploit their usefulness. Many prominent men in aeronautics recognize the potentials and are actively promoting the water-based airplane concept (for example, see comments by W. J. Duncan in "Journal of the Royal Aeronautical Society," May 1958).

Water-based airplanes find valuable applications in many missions including ASW, ASR, operations in remote areas, submarine and ship reprovisioning etc. In some of these operations, landplanes are inferior, and in some they plainly cannot do the job. You wouldn't think twice about refusing to use your new Chrysler in open terrain or in the desert—it just wouldn't do the job. But a specially designed and engineered four-wheel drive vehicle will.

Let us not continue to close seaplane research and development facilities and everyone go orbiting into space, but rather let us develop the potentials of water-based aircraft, taking advantage of the latest developments in the state of the art. Certainly past progress in seaplanes has been seemingly slow rela-

tive to landplane advancements, but seaplane gains have been large in terms of the relatively small expenditures of funds. Mr. Name Withheld's conclusions are based upon the use of old flying boats and not modern water-based airplanes. Let's get modern!

Robert H. Oversmith
Senior Hydrodynamics Engineer
Convair
San Diego, Calif.

EDITOR'S NOTE—A good point but the landplane versus seaplane controversy will never be settled on paper. It will persist until we get down to specifics with actual modern hardware.

Lighter-Than-Air Man

In reference to the article "Is the Army Asking the Impossible?" (AMERICAN AVIATION, June 2, p. 15). I have been watching this heavy lift aircraft battle with keen interest. While aircraft such as the C-132 are not quite as thrilling to see or fly, their development is as important to our security as paying our debts.

When Mr. Douglas spoke of a "merchant marine of the air" he spoke in parallel to a movement that has bounded in and out of Washington more times than one cares to think about in the past twenty years. Had any of the proposed bills become law we might now have aircraft far surpassing the C-132 at our disposal today. The last bills proposed concerned the joint use of HTA (heavier than air), and LTA (lighter than air) for an airgoing merchant marine.

What might the airship look like and perform like today had we continued on its development as was recommended back in 1938?

The average citizen was never aware of the fact that we were on the verge of perfecting the airship. The airship interests did more than any other single group to perfect quality control in metal fabrications. They in their efforts made the airship practical. Why then did we not go on from there?

At this date the field is wide open

AMERICAN AVIATION offers these columns to readers for expression of opinion and criticism on the editorial content of this magazine and/or happenings in the aviation industry. Address such correspondence to Joseph S. Murphy, Executive Editor, American Aviation, 1001 Vermont Ave., Washington 5, D.C. Anonymous letters will not be printed; however, names will be withheld on request.

for really big strides in LTA, what with the heavy take-off concept, titanium covering atomic engines, ducted-fan maneuvering devices, high-shear rivets, magnesium castings and heli-welding. Add these things up and utilize them and the Army would not be asking the impossible.

Another little understood development was the metal-clad airship (ZMC-2). This blimp was not an end in itself but a test vehicle for a weight lifter of much greater size and lift. This ship had very outstanding strength and gas holding qualities and possessed many characteristics desirable in a modern, wide speed-range airship.

Anyone who cares to really research the facts in FULL, as I have done in the past eight years, and assimilate them in a fair-minded manner, will reach the conclusion that LTA has been given far too little serious thought in the past 10 or 15 years. If the present LTA movement succeeds we stand to equal those advances of HTA made over the past 25 years.

The semi HTA/LTA craft is a very sound answer to what the Army needs and the only things that could hold it up would be the self-imposed mental block, or money. If we can spend billions on weapons, we can't afford to go without the vehicles to get them where they are needed no matter what this vehicle may look like or be called. If it fits the bill, use it.

Our country was built by men of imagination. Suppose Henry Ford took the word of his contemporaries to be final. We would have waited quite a few years for a cheap car. I say we should, with our 25 years' experience to back us up, beat the old LTA bugaboo and transport the tons.

Let's get out of the rut and fill the Army's bill. If we can't design an airplane to do the job we can design a combination airplane ducted fan craft and airship to do the job.

What are we waiting for?

Raymond J. Schmitt
Castro Valley, Calif.

EDITOR'S NOTE—Again (see letter on seaplanes) you can't win a paper argument, although the LTA with its built-in helium shield makes sense for an airborne reactor test vehicle.

Answer to Renegotiation?

Re your editorial "Small Business is Hurting" (AMERICAN AVIATION, June 16):

I sat on a Board that "renegotiated" the pants off a small business corporation. The Kingfish said to me, "Mr. X,

you haven't said anything: what is your thought about the matter?" I said, "Sir, I was just thinking that I am the *only man* around this table who has *ever had to meet a payroll*." That was the last time I was asked to be present. Until this whole business of renegotiation is placed in the hands of civilians (businessmen) it will be just a farce.

RDL
New York

Supplier Missing

We were particularly interested in your U.S. Turbine Transport furnishings report (AMERICAN AVIATION May 19, pp. 30 & 31).

Scott Aviation Corp. is producing more of the oxygen equipment for more of the world's jet transports than any other single manufacturer. Part of the equipment we produce are the oxygen outlets for the Lockheed 188 Electra. On page 31, under the miscellaneous category for the Electra, you have given credit for those outlets to another manufacturer.

Regis J. Stevenson
Civil Aviation Sales Manager
Scott Aviation Corp.
Lancaster, New York

Liked Australian Stories

Allow me to take this opportunity of letting you know how much I enjoyed your articles in AMERICAN AVIATION on your recent trip to Australia and, currently, the articles on New Zealand.

Being an Australian and having recently taken up residence in Chicago, I eagerly looked forward to each issue, not without quite a bit of nostalgia. As I had an extensive tour of New Zealand myself, from Cape Reinga in the North Island to Stewart Island off the South Island, I can appreciate every article.

Might I add that I am from Perth, Western Australia, which place I feel you were quite impressed with.

Please, Mr. Parrish, don't take offence that we Australians stared at you eating with your fork in your right hand. This takes some adjusting to, but I believe I have mastered it now.

Mrs. D. Harris
Chicago

For the Record

I refer to page 52 of your April 7 issue where the statement is made that "F-2" is the first Fokker design to carry an airline's colors in 25 years. Last was the Fokker Trimotor."

(Continued on page 12)

THE CONVAIR 240



THE CONVAIR 340



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LETTERS

As late as August 1942 Fokker Trimotors were performing extraordinary service in the Belgian Congo for Sabena, who was of course unable to procure any replacements at that time. I believe a check with Sabena would probably show that the last of these rugged old machines was not finally retired until 1944 or even 1945.

William H. Dunbar
American Vice Consul
Abidjan, Ivory Coast
French West Africa

Correction Accepted

Shame on you! In "Personal View" in your June 16th issue appears the sentence: "When Lockheed Aircraft undertook to design and build the turboprop Electra transport there was no suitable U.S. propjet engine available." We have become somewhat injured to the appearance of the word "Propjet" in airlines advertising but to see it used by the respected editor of AMERICAN AVIATION, and in the same sentence with the correct term "turboprop" is too much! Surely everyone in the aircraft industry agrees that a propulsion system using a gas turbine engine to

drive a propeller is a "turboprop" and a propulsion system using a gas turbine engine to push air through a tube is a "turbojet."

In looking through the same issue I note that even the British are becoming subverted. Rolls-Royce advertises "prop-jet or turbo jet engines." (Why the hyphen in one case and not the other?) However, further down the advertisement they make it clear that they are really talking about "gas turbines." On the other hand Esso can be given a clean bill of health. In their advertisement they say they manufacture oil for "turbo-jet and turbo-prop engines." (Note the hyphens.) In fact they even identify the Allison 501 that you were writing about as a turbo-prop engine.

Canadair also deserves a pat on the back. They refer to their 540 as a "turbo-prop." But Vickers succumbed long ago, the Viscount according to them is a "jet-prop." (How does a jet-prop differ from a prop-jet?) A new low is attained by Fairchild, for on the front cover the F-27 is advertised as America's first "jetliner" which would lead one to believe that it doesn't use propellers.

More About Transports

In the June 30 issue of AMERICAN AVIATION, specifications on the Convair 440 Metropolitan inadvertently were omitted from page 22. Also on page 42 a photo of a Continental Air Lines Viscount 810 was shown with specifications for the Viscount 800. Revised specifications are listed here and it is suggested they be cut out and inserted in their respective pages of the directory.

Vickers Viscount 810 (Great Britain)

TYPE: 52-65 passenger, four-engine commercial turboprop transport. DIMENSIONS: L—85' 8"; span—93' 11"; H—26' 9". WEIGHTS: empty—41,276 lbs.; gross—69,000 lbs. POWERPLANTS: (4) Rolls-Royce Dart RDa7 Mk. 525; normal eshp—1,990. PERFORMANCE: cruise speed—365 mph at 60,000 lbs.; initial rate of climb—1,350 fpm; max. range—1,960 mi. MANUFACTURER: Vickers Armstrongs (Aircraft) Ltd., Weybridge, Surrey, England. REMARKS: Viscount 810 is a progressive development of the 800 series. Continental Air Lines is the first U.S. operator of the Viscount 810.



Convair Photo

Convair 440 Metropolitan

TYPE: 44-52 passenger, twin-engine commercial transport. DIMENSIONS: L—79' 2"; span—105' 4"; H—28' 2". WEIGHTS: empty—31,305 lbs.; gross—49,100 lbs. POWERPLANTS: (2) Pratt & Whitney R2800-CB17s; normal hp—2,500. PERFORMANCE: max. speed—310 mph; cruise speed—289 mph; rate of climb—1,260 fpm; max. range with full payload—1,300 mi. MANUFACTURER: Convair, a Div. of General Dynamics Corp., 3165 Pacific Highway, San Diego 12, Calif. REMARKS: The Convair 440 is a refined version of the Model 340. Both models superseded the slightly smaller Model 240. A total of 1,075 civil and military 240, 340 and 440s were built between 1947 and 1958.

Perhaps there is nothing we ordinary humans can do about the technical inaccuracies and plain distortions practiced by the strange breed that writes advertising, but please let's not be guilty of that sort of thing in aviation technical writing and journalism.

No more "propjets" please!

J. H. Pratt,
22610 Collins St.,
Woodland Hills, Calif.

EDITOR'S NOTE—We missed and you caught us the first time. No more "editorial" prop-jets.

When & Where

AUGUST

American Society for Quality Control, western region annual conference, El Cordes Hotel, San Diego, Aug. 7-8.
OX5 Club of America, annual national convention, Hotel Statler, Los Angeles, Aug. 7-9.
Experimental Aircraft Assn., annual fly-in and convention, Curtiss-Wright Airport, Milwaukee, Aug. 8-10.
National Flying Farmers Assn., annual convention, Hotel New Yorker, New York City, Aug. 11-15.
ASME, Heat Transfer-American Institute of Chemical Engineers, conference, Northwestern University, Evanston, Ill., Aug. 18-21.
IRE and West Coast Electronics Manufacturers Assn., western electronic show and convention, Ambassador Hotel and Pan Pacific Auditorium, Los Angeles, Aug. 19-22.
Annual Jayco Air Fair in conjunction with dedication of new airline terminal, International Airport, Portland, Ore., Aug. 23-24.
National Flying Club Assn., annual convention, Hollywood Roosevelt Hotel, Hollywood, Calif., Aug. 25-27.

SEPTEMBER

SBAC annual flying display and exhibition, Farnborough, Hants, England, Sept. 1-7.
International Aviation Show, Coliseum, New York City, Sept. 6-14.
First International Congress of Aeronautical Sciences, Palace Hotel, Madrid, Sept. 8-13.
Air Cargo, Inc., air freight cartage conference, Hotel Sherman, Chicago, Sept. 9-10.
American Rocket Society, fall meeting, Hotel Statler, Detroit, Sept. 14-18.
American Petroleum Institute, Aviation Technical Service and Aviation Advisory Committee, joint meeting, Melrose Hotel, Dallas, Sept. 15-17.
Instrument Society of America, annual instrument automation conference and exhibit, Convention Hall, Philadelphia, Sept. 15-19.
National Business Aircraft Assn., annual meeting, Bellevue-Stratford Hotel, Philadelphia, Sept. 22-24.
National Assn. of State Aviation Officials, meeting, Bellevue-Stratford Hotel, Philadelphia, Sept. 24-26.
American Helicopter Society, annual western forum, Ambassador Hotel, Los Angeles, Sept. 25-27.
Air Force Assn., annual convention and air-power panorama, Dallas, Tex., Sept. 25-28.
SAE aeronautic meeting and aircraft production forum, Ambassador Hotel, Los Angeles, Sept. 29-Oct. 3.

OCTOBER

Champion Spark Plug Co.'s distributor and executive operators clinic, Secor Hotel, Toledo, Oct. 6-7.
Canadian Aeronautical Institute—IAS, joint meeting, Chateau Laurier, Ottawa, Oct. 7-8.
Champion Spark Plug Co.'s annual aviation spark plug and ignition conference, Secor Hotel, Toledo, Oct. 8-10.
Armour Research Foundation and Illinois Institute of Technology, annual noise abatement symposium, Hotel Sherman, Chicago, Oct. 9-10.
Air Mail Pioneers 40th anniversary Ball, Beverly Hilton Hotel, Beverly Hills, Calif., Oct. 10.
Annual New York State airport development and operations conference, Onondaga Hotel, Syracuse, N.Y., Oct. 14.
Annual Indiana aviation conference, Turkey Run State Park, Ind., Oct. 15-17.
Annual symposium on aviation medicine, Miramar Hotel, Santa Monica, Calif., Oct. 22-24.

When it doesn't pay
to gamble....



The instant an aircraft becomes a land-borne vehicle, the pilot faces his greatest challenge: a sure, safe stop in a given distance under variable runway and weather conditions.

If there is no device for detecting and preventing an incipient skid... that is a gamble with lives and equipment that you cannot afford. To eliminate the hazard of skids and blowouts, America's foremost commercial and military aircraft designers have specified the installation of HYTROL—the accepted anti-skid braking system.

More than 6,000 aircraft now in service land with HYTROL protection. Latest HYTROL users include all three of the new commercial jet transports—DC-8, 707, and 880.

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Controls • Actuation Systems

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CONVAIR JET-LINER
MASTERPIECE OF *Design*

Designed in every detail to lead the way, the new jet-age Los Angeles International Airport and the Convair Jet-Liner will bring tomorrow's travel beyond your dreams.

For you, the jet-age traveler, both this airport and the Convair 880 Jet-Liner are *Masterpieces of Design*.

CONVAIR

A DIVISION OF GENERAL DYNAMICS CORPORATION

Among airlines first to offer Convair 880 Jet-Liner service will be TWA, DELTA, TRANSCONTINENTAL (Argentina), REAL AEROVIAS (Brazil)

MILITARY/MANUFACTURING

AIRTRENDS

An American Aviation and Aviation Daily Staff Report

Edited by Elizabeth Oswald and Albert Bentz

Mideast crisis may speed up West German order for F-104s. Lockheed is especially keen to get this order since it would mean a chance at other business with NATO countries and maybe a crack at an order from Japan. Lockheed also hopes for more Air Force orders before lead-time runs out.

P&W's JT12 may be ready before either the Fairchild J83 or GE's J85 production types are available. Meantime, Lockheed-Marietta and Northrop are awaiting production models of the J85, on which they have standardized for the JetStar and the T-38, respectively.

Word from P&W is that the single-rotor, 2,900-lbs.-thrust JT-12 has completed significant pre-flight tests. Design of the lightweight (430 lbs.) engine was started only a year ago. Already, it has completed a 15-hour rating test for missiles and has run for sustained periods at full power.

One 'if' remains before Lockheed clearly breaks even on the Electra. If company gets big planned order for anti-submarine (ASW) aircraft, program will be well in black. Presently, 151 Electras have been sold. Actual break-even point is difficult to determine at this time because all manufacturers are in the used aircraft business—trade-ins are often part of the purchase price of jets and turboprops. Answers won't be known until trade-ins are sold.

Lockheed wants to sell both AF and Navy a new aircraft early warning plane (AEW) but hasn't had much luck so far because neither service has any money for this type of aircraft. Company believes fixed warning lines aren't good enough, that ultimately they can and will be jammed, and that new aircraft will be absolutely essential.

A long, hard, new look at current aircraft programs will be taken by the Pentagon as a result of Middle East developments. Best guess is that more interest will be shown in tactical-type planes, with emphasis on fighter-bomber types.

There's a question-mark about engine delivery for the T-38. The first of these supersonic trainers is set to roll out on August 18. If engines arrive, second plane will come off the Northrop line six weeks later. For greater visibility, two-place trainer puts instructor in slightly elevated seat behind his pupil. Plane would be advanced trainer for Air Training Command.

Small business can expect more military business. This is not necessarily the result of congressional prodding. It stems from the military need for new blood in the R&D areas. Air Research and Development Command, for instance, is stepping up its program to use technically-competent small firms and is asking them to submit proposals in R&D fields in which Air Force might be interested.

Nuclear-powered jet will play second fiddle to atomic ramjet missile or A-powered rocket. Progress on the aircraft end is limited by the amount of money going into the project. Shielding is the big problem—new materials must be found to protect crews.

Navy reportedly is happy with Martin XP6M SeaMaster's evaluation performance, particularly after one of the four-jet seaplanes rode out 4½-ft. waves and 68-knot winds in Maryland's Chesapeake Bay for more than two hours recently. Plane was at its full gross of 160,000 lbs. No damage or post-flight problems were reported. Navy is building a special base at Harvey Point, N.C., to house the new jet seaplane fleet, which it calls a "significant part" of the Atlantic striking force.

Some signs of the times in the ever-changing aircraft industry: 1. Merger talk of buying diversification and engineering know-how, as well as cutting costs. 2. Growing use of engineers to sell the complicated new machines. 3. Feeling of some companies that banking or financial training would help in working out necessarily complex financial deals.

Answer to some NATO problems may be the Northrop N-156F light twin-engine fighter. There is considerable interest in reduced costs of maintenance and operations and in the safety factor inherent in the twin-engine design. Canada is reportedly interested in a fighter-bomber version which is likely to reach Mach 2.

Long-needed coordination of Pentagon research programs is almost assured once a newly-authorized Research and Engineering Director is on the job. Under legislation revamping the Defense Department, R&E Director will outrank assistant defense secretaries. Armed with contract powers delegated by the Defense chief, director is assigned to oversee all research activities, should be able to sharply reduce—but not eliminate—duplication.

Note: There won't be two research heads dispensing contracts. Proposal strips the Advanced Research Projects Agency of its contracting power, gives it to new director.

Closing of regional public information offices of the Army, Navy and AF in New York, Chicago and Los Angeles is being studied. Fear is that these offices are too far away from Pentagon and therefore less controllable. Suggested alternative is to set up joint Army, Navy, Air Force offices. Decision will be based on report of Chauncey Robbins, deputy to Assistant Defense Secretary Murray Snyder, who has just completed a survey.

Why are military services—especially USAF—so far behind on air logistics? The blame can be placed on former Defense Secretary Charles Wilson. He couldn't see using airplanes for lift and scotched many airlift projects. (He was behind the times on many other forward-looking projects, also.)

Pentagon has issued special instructions to improve accounting and reporting procedures and has set up uniform peacetime operating and safety levels of supply for common items. Under one new instruction, appropriated funds will be accounted for in a simplified form: fund resources minus unpaid obligations equals unobligated balances. Unex-

pended balance of each appropriated fund account must agree with the Treasury Department balance.

Trend toward standardization of Allied air-power along American lines is continuing. U.S. and Australia are discussing closer military cooperation. Australia's stated policy is that equipment used by its forces be standard or compatible with the U.S. It already has F-86 fighters, recently ordered a dozen Lockheed C-130s. A major effort also is being made in R&D information exchange so Australia may expend resources and production efforts on most promising new developments.

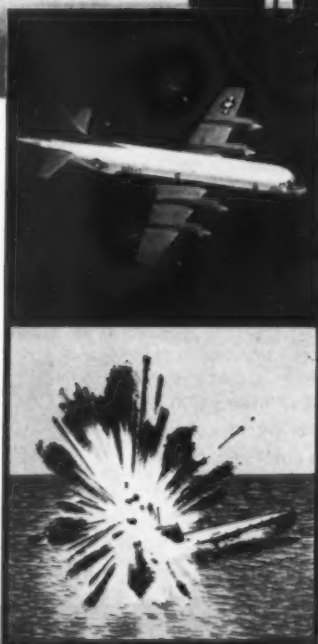
Air Force Directorate of Flight Safety will work with Boeing engineers prior to delivery of first 707s for use of the President and high Pentagon brass. Action is in line with usual practice, to reduce safety hazards by making use of all information turned up by other planes in operation.

Reappraisal of military airlift capability is virtually certain as the result of experience in airlifting troops from Europe to the Middle East. There appeared to be ample airlift, but for the most part it was slow and too cumbersome to suit many Pentagon observers. During the initial stages of the lift, at least, there were only 50 modern aircraft in the area. These were Lockheed C-130s. Air Force has about 180 of these scattered over the world.

One manufacturer cut its estimate in half to win a recent military competition for a new small turbine engine. Originally, costs of developing the engine were estimated for military alone. Then, when commercial possibilities became apparent, company made the chop.

It'll be easier for military contractors to report technical information on spares under a new Defense Department instruction (3232.7). Instruction standardizes format for reporting such technical data and sets up uniform requirements for all services. Industry played major part in drafting the instruction. It goes into effect Oct. 1. After first of the year, it will be included in all military contracts.

TRACKDOWN... *Electra/Style!*



Sneak attack by missile-carrying enemy submarines is a growing menace. To bolster America's defense, the Navy has selected the prop-jet P3V-1 ELECTRA for further development for antisubmarine warfare duties.

The P3V-1's four mighty Allison Prop-jets combine turbo-jet power with propeller efficiency and dependability. ELECTRA can cover more ocean, cruising twice as fast as current sub-killers. Yet it flies easily and steadily at slow, trackdown speeds—at high or low altitudes, or in between.

Military sister to the commercial ELECTRA (soon to go into service throughout the world), the antisubmarine P3V-1 will also bring greater efficiency to crews who must remain "hair-trigger" alert through long hours of trackdown maneuvering.

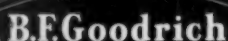
The world's seas will no longer be a safe haven for lurking enemy submarines.

LOCKHEED *means leadership*

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ANTISUBMARINE PATROL PLANES • JET FIGHTERS • JET TRAINERS • LUXURY AIRLINERS

PROP-JET TRANSPORTS • AIRBORNE EARLY WARNING AIRCRAFT



B.F. Goodrich



B. F. Goodrich Fabric Tread Dimple Tire proved "far superior" in F-106 tests

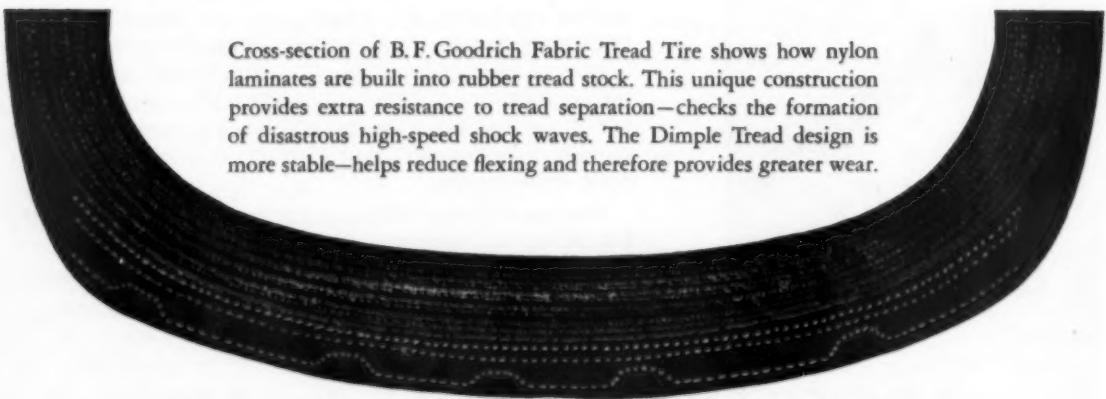
Ordinary high-performance tires used on the F-106 built by Convair, a division of General Dynamics Corporation, just couldn't take the punishment. The stress of high-speed takeoffs and landings literally tore them to pieces.

Then B.F. Goodrich submitted its revolutionary new Fabric Tread Dimple Tire for testing. Even under severe operating conditions, including repeated RTO situations, the tire proved that it could out-perform and out-wear any jet tire known today. As a result, the B.F. Goodrich Fabric Tread Dimple Tire is standard equipment on the F-106 Delta Dart, world's fastest and highest flying all-weather interceptor.

The amazing performance of the B.F. Goodrich Fabric

Tread Dimple Tire is made possible by two exclusive features. Plies of nylon cord are built right into the rubber tread stock to equalize the modulus between tread and carcass. This cuts the amount of heat normally generated by flexing between the two elements of the tire. In addition, the special Dimple Tread design eliminates stress points in the tread and therefore provides greater resistance to cutting and chipping.

B.F. Goodrich Fabric Tread Tires mean safer takeoffs, more landings, for supersonic aircraft of all kinds. Available with either Dimple or Sinewave Tread design. For more information, write B.F. Goodrich Aviation Products, a division of The B.F. Goodrich Company, Akron, Ohio.



Cross-section of B.F. Goodrich Fabric Tread Tire shows how nylon laminates are built into rubber tread stock. This unique construction provides extra resistance to tread separation—checks the formation of disastrous high-speed shock waves. The Dimple Tread design is more stable—helps reduce flexing and therefore provides greater wear.

B.F. Goodrich aviation products

Until last fall the United States was used to believing in its own "qualitative superiority." But that mood was blasted by Sputnik I and II.

Everybody wanted to know "What happened? What should we do now?" Gen. Thomas D. White, Air Force Chief of Staff, asked the AF's Scientific Advisory Board to review Air Force organization and policies as they related to R&D.

The result was the special committee of a group

of distinguished civilians headed by H. Guyford Stever, former AF chief scientist and now associate dean of engineering at MIT.

Now the group has filed a report recommending a sweeping reorganization of the Air Research and Development Command and basic policy direction. It is the first such published report since the Deputy Chief of Staff (Development) and ARDC were created some eight years ago.

What Will Happen to ARDC—Now?

By Betty Oswald
Defense Editor

Scientific effort cannot flourish in a tightly controlled atmosphere where the scientist is uncertain of his right to move forward in new and uncharted waters. Similarly, significant progress cannot be made when time and effort must be spent in justifying projects, down to minute details, to budget and fiscal officers or to higher authority which can't or won't trust the research project officers.

Key to a reorganization of military generally and Air Force research and development in particular, according to the Stever Committee, is trust, which would allow for the delegation of both responsibility and authority to project level, with minimal policy guidance and program control coming from top-side. First result would be to eliminate excess staff and second would be to allow the staff to get on with the job of meeting the Russian challenge of superior weapons.

How can this best be accomplished within the Air Force itself, without riding off in all directions at one time—providing necessary but not excessive supervision and control?

The Stever Committee's answer is a functional reorganization of ARDC, eliminating the current geographical setup with its overlap of functions and "empire-building" both at headquarters and in the centers and laboratories. A functional reorganization would eliminate also current confusion in management authority and mission responsibility which is breeding distrust, excess costs and overloads of administrative personnel, according to the committee.

Under this scheme of things, there

would be deputy commanders in charge of research, technical development, aerodynamic weapon system management, ballistic weapon system management, air defense system management and testing. These men would be responsible for program guidance and direction, as well as putting together the packaging of facilities, money and personnel required for the program.

These men would also control their programs within any of the Air Force Development Centers where capabilities for such work exist.

• **What DC/R's job would be**—What is the job of the deputy commander for research, under the committee's plan?

Basically, he would be responsible for all exploratory research, i.e., research which is completely nondirected, has no specific end item in view and is oriented only toward increasing the sum total of human knowledge. His office would be located in or near Washington, D.C., to permit close association with the Defense Department, Air Force headquarters, the Office of Naval Research, National Science Foundation, National Advisory Committee for Aeronautics and the Atomic Energy Commission.

To the question of whether AF or any other military department should be involved in exploratory research, the committee answers a resounding "yes." It bases this conclusion, at least partially, on the belief that in the level of government above the Air Force there has been a lack of understanding of sciences related to air power.

How should the office of deputy commander for research be organized? First of all, says the committee, there should be separate divisions for physical

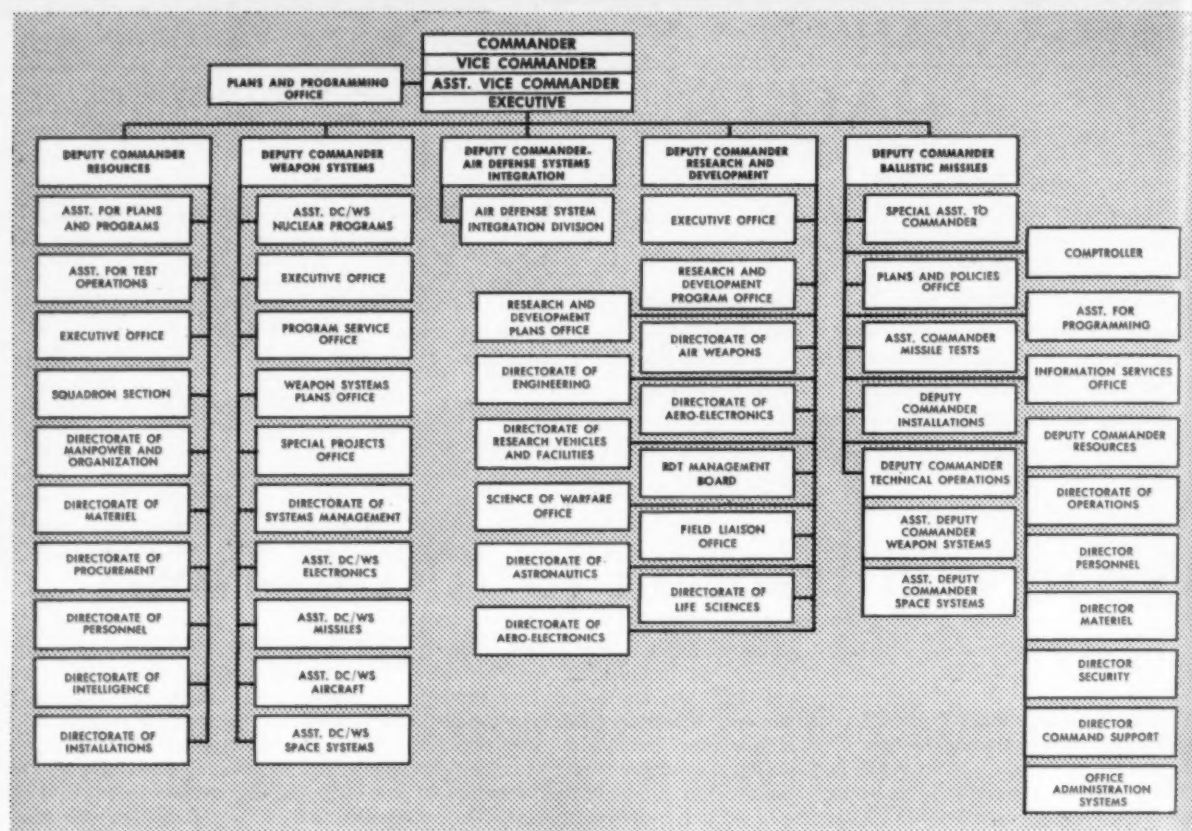
and life sciences (medical, biology, psychology and social sciences).

Second, and perhaps most important, the office should not be organized to fit normal military command patterns. The man for the top job might well be a distinguished civilian scientist. If no such man is available, then the commander should be picked, says the committee, on the basis of qualification to work with the "country's leading scientists."

Under this concept, the whole organization would lean heavily on civilian leadership. This would mean a civilian technical director for the whole organization and possibly civilian directors of the in-house laboratories.

What are these laboratories and organizations which the deputy commander of research would control? They are, according to the committee: Aeronautical Research Laboratory of Wright Air Development Center; Geophysics and Electronics Directorates, of Cambridge Research Center; Aeromedical Field Laboratory of Missiles Development Center; Brussels, Belgium Office of ARDC, and the nonclinical research laboratories of the School of Aviation Medicine. Office of Scientific Research would, of course, belong to this organization. However, no conclusion is reached on turning over Armed Services Technical Information Agency to the deputy research commander.

The office would supervise both all in-house research and contract research falling within the area of exploratory research. The committee suggests that one of the first jobs to be done is a study to determine what in-house research activities should be retained, which should be put under nonprofit contract operation and which should be



This is the present organization of ARDC and . . .

performed under regular AF contract.

In recommending that in-house research be strictly limited, the report said: "The atmosphere within military R&D organizations, the problems of maintaining properly compensated staffs under Civil Service, and the lack of broad unhampered contacts with the academic world limit the effectiveness of most military-operated laboratories in the field of basic research."

Again in the area of technical development, the committee sees the need for an in-house capability. Criteria for the decision as to where the work should be done must be established—with the decision being based on the answers to such questions as:

1. Can the work be done effectively by one or more contractors without the necessity for duplicating facilities already available in ARDC?

2. At what point in development can the responsibility be transferred to an outside contractor?

3. Is direct participation by ARDC essential to providing ARDC with the ability to successfully monitor contract efforts in this or some closely allied fields?

In recommending a new deal for technical development, the Committee

found a considerable competence within the Air Force. However, because of overemphasis on weapon system project management, there has been a tendency to neglect state-of-the-art development on which all progress is built.

• **Undesirable consequences cited**—Practices in the procurement and management of research and development on weapon systems have led to four "undesirable consequences," according to the committee. These are 1. Failure to obtain the benefits of optimum state-of-the-art development. 2. Unnecessarily high costs in some cases. 3. Reduction of the incentives for intensive state-of-the-art development. 4. A decline in the basic competence and morale of the AF R&D organization.

What is the new organization which would correct these faults? All technical development, however located, would be brought together under a deputy commander, with headquarters at Wright Air Development Center at Dayton, Ohio.

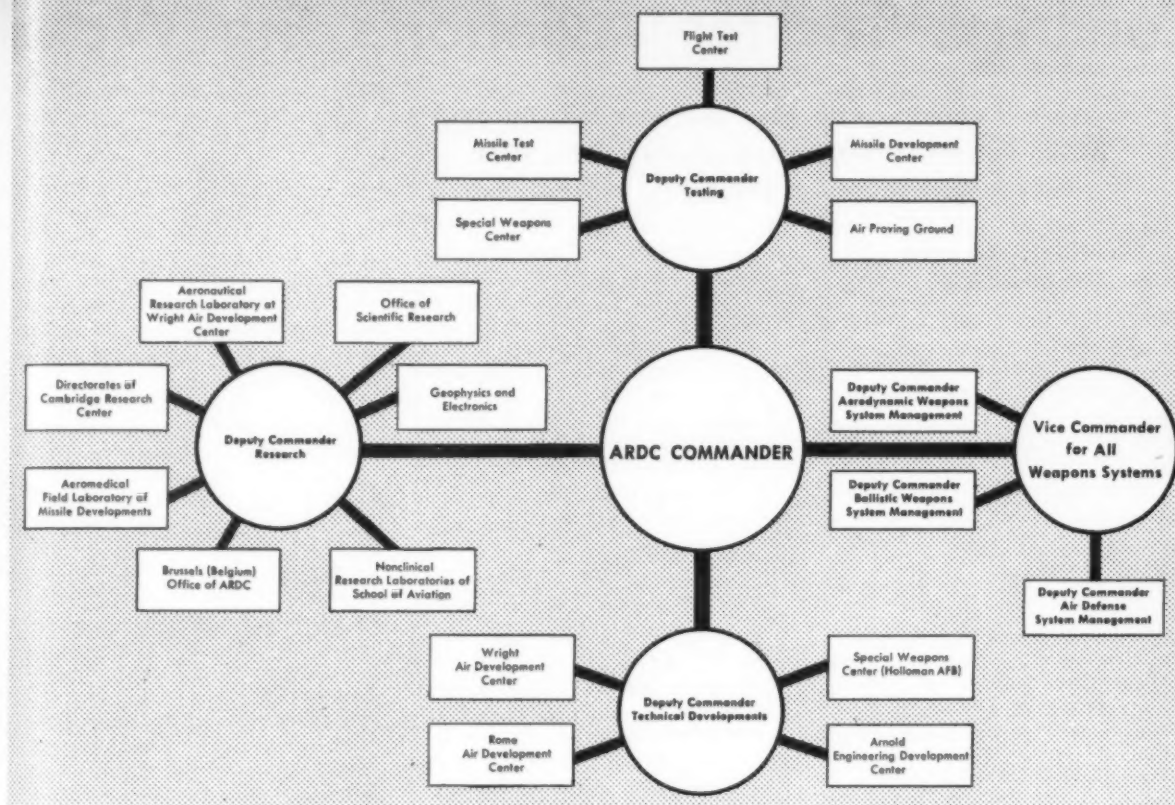
He would be responsible for supporting research (research directed to a definite problem area); state-of-the-art development (applied research

which aims not at a particular weapon system but rather at processes and breakthroughs which might improve many weapon systems); and technical development which aims at development of components for a specific weapon system.

To do the outlined job, the committee would give responsibility to the deputy commander for all ARDC laboratories and centers engaged in technical development. These include: Wright Air Development Center; Rome, N.Y. Air Development Center; possibly the Special Weapons Center at Holloman AFB and probably Arnold Engineering Development Center, at Tullahoma, Tenn.

General objectives of the new organization would be substantial programs not restricted by normal military and production specifications. One specific objective would be to obtain demonstration models designed to establish functional feasibility and not final design characteristics. Possibility of new approaches to component and equipment development should be explored. Occasionally, the program outlined by the committee would even include the design of major weapon subsystems.

• **Vice-commander for weapon systems**



... This is the recommended reorganization

—Weapon systems are obviously the heart of the AF mission. As a result, the committee recommends a vice-commander to have responsibility in this area. Under him would be a deputy commander for aerodynamic weapon systems, one for ballistic missiles and one for air defense systems.

As outlined in the report, the deputy commander for aerodynamic weapon systems management would be located at Wright-Patterson AFB. His responsibility would be management of the development of all airborne systems including their ground components. Organization would take a leaf out of the book of the Air Materiel Command in the handling of systems once in production for inventory.

The Ballistic Weapon System management deputy would continue to work in Los Angeles. The only recommendation made here is that AF should relax detailed management as its contractors prove to be more capable of handling details.

As far as air defense systems management is concerned, the committee notes that AF has recently established "the equivalent" of the deputy commander recommended. The deputy commander would have, under the

committee concept, complete authority with respect to the development of all major ground environmental systems, presumably including SAGE and the various early warning lines, as well as the ballistic early warning system.

Turning finally to testing, characterized as the "largest single functional activity of ARDC in terms of funds, personnel and facilities," the committee found that current organization did not provide for effective management.

Here, too, it wants a deputy commander for testing with complete responsibility for all phases and types of evaluation testing wherever conducted. The committee wants the job done independently of those responsible for research, technical development and weapon system development.

Concentration of all such authority in a single office would help (according to the committee):

1. Clarify the mission of the center now engaged in evaluation testing.
2. Improve use of testing resources.
3. Eliminate duplications in test facilities.
4. Substantially reduce the number of facilities now being used, with the ultimate disposal of some major facilities a definite possibility.

5. Provide better planning of future requirements for test facilities.

The committee would give the deputy for testing control over the Flight Test Center at Edwards AFB, the Air Proving Ground Center at Eglin AFB, the Missile Test Center at Cape Canaveral and possibly the Special Weapon Center at Holloman AFB. Headquarters would either be at Edwards or the Air Proving Ground if the committee's recommendations are followed.

In addition to being responsible for all evaluation testing, the deputy commander would have to provide facilities and services needed for development testing under the supervision of the deputy commander for research, technical development or weapon systems.

• **Believe cost reductions possible**—Underlying this whole section of the report is the belief that through better organization, overlap in facilities can be eliminated and excessive management costs reduced. In this connection, it is recommended that the deputy commander for testing look at the possibility of operation as well as planning and development of test facilities by industrial contractors.

Congress Tackles Aviation's Big Woes

- FAA bill clears Senate, goes to House for approval
- MATS debate unresolved; new restrictions loom
- Hebert group to probe Pentagon procurement

By Charles Schaeffer
Congress Editor

A closely-watched bill to create a single Federal Aviation Agency moved nearer to enactment as the Senate voted its approval and sent the measure to the House.

The far-reaching legislation, incorporating CAA, the Airways Modernization Board and the safety rule-making powers of the CAB, would set up a single civilian Administrator to chart the nation's airlines, write traffic rules and spur air navigation research.

Significantly, it provides for military representation in the form of a Deputy Administrator. Nearly all aviation quarters agreed that Pentagon policymakers needed a firm place in the agency to protect their interest, but also to share in the vital program of laying out an air traffic system designed to avoid tragic midair collisions.

A compromise provision of the bill requires Pentagon officials to give the Administrator advance notice of plans to establish missile or air base sites. If the choice conflicts with the FAA reasoning, the Administrator can notify Congress and then take his complaint to the President. A threatened fight over the military insistence on its right to locate airfields and missile sites collapsed when the compromise was adopted.

Other main provisions of the bill, which repeals and re-enacts the Air Commerce and Civil Aeronautics Acts, would:

- Bar appeals to CAB from FAA safety rules, in cases where owners of airmen or aircraft certificates can show injury "by certificate denial, modification or revocation . . ."

- Establish authority for special inquiry boards to probe mishaps of "specially disastrous nature."

- Provide clear statutory authority for centralized control of air space.

- Create a statutory Civil Aeronautics Board, retaining the present make-up of the Board and leaving undisturbed its economic power.

- **MATS debate unresolved**—While the potential solution to some civil aviation woes seemed in sight, one old problem persisted. Air transport repre-

sentatives trekked to Capitol Hill with charts and figures in an effort to show that Military Air Transport Service was running the "world's biggest airline."

Members of the Senate Military Appropriations Subcommittee, themselves apparently convinced that MATS was ignoring a year-old directive instructing the military airline to split its passenger and freight business on a 40/20 ratio with private carriers, prepared to write some new, perhaps more binding, fiscal restriction.

If MATS didn't have enough troubles, CAB and congressional critic Daniel Flood (D-Pa.) proposed bills to enact a no-competition policy. Flood went a step further, proposing that Congress double the size of the Civil Reserve Air Fleet.

Apparently to counteract MATS' bad press on the Hill, the House Armed Services Committee invited blunt Air Force Vice Chief of Staff Curtis LeMay to support the need for a battle-ready transport service.

To private aviation interests MATS is not the only problem. The Aircraft Service Association, representing 12 firms in the field of aircraft maintenance and overhaul, brought a complaint against military competition to the same subcommittee.

ASA's executive director Thomas Wolfe charged that the Navy award of overhaul contracts had dwindled from a low 3.5% to "zero" in fiscal 1959. He recommended that Congress require the Navy to contract "a minimum average" of 45.5% of its aircraft overhaul work to private firms.

Wolfe cited a subcommittee survey, showing that the Air Force has restored its share-with-industry policy of allocating 45%; and it was testified that the Army was placing 87% of its overhaul funds for competitive bidding. It was the Navy, ASA charged, that needed jogging.

Wolfe also urged:

A congressional probe of the whole subject of military workshop competition.

That the Navy be required to report quarterly to Congress until "short and long-range objectives are reached."

Establishment of a clear line between government workshops and industry, modification and repair overhaul in budgetary reports.

Of concern to industry elsewhere, the Senate Armed Services Committee approved legislation to overhaul the Department of Defense. The bill, giving special legislative support to the Navy's air arm, contains no major changes from House-passed legislation.

The bill authorizes appointment of a new Pentagon director of research and engineering. Senators gave the Defense Secretary most of the streamlining authority sought by the President. Power to transfer and abolish functions, except those statutorily authorized by Congress, was granted.

Congress also stamped its approval on legislation creating a new civilian-directed National Aeronautics and Space Administration. Aided by a nine-member space council, the Administrator is charged with the duty of developing an advanced aeronautics and space program.

The space administration will absorb the personnel and facilities of the National Advisory Committee for Aeronautics. It is directed to coordinate closely with military aeronautic and space planners.

In other developments:

- The House Armed Services Committee dropped consideration this year of legislation that would have authorized the Defense Department to indemnify defense contractors up to \$500 million. Explanation was that far-reaching implications of the measure barred hasty action as Congress moved into the home stretch.

- The special (Hebert) investigating unit of the Armed Services Committee launched a probe into "conflicting" Pentagon procurement rules. Army, Navy and Air Force witnesses were summoned to explain why regulations for similar purchases sometime varied widely between services.

- The House Judiciary Committee approved Pentagon-requested legislation for emergency contract powers. The bill was approved as submitted by the Defense Department, except for the addition of an amendment requiring the department to submit an annual report to Congress on actions taken under the statute.

Replacing Title II of the War Powers Act, it would continue similar authority to enter into, modify and amend contracts, and make advance payments. The bill would extend for the duration of national emergencies, including the present one, as endorsed by the House. There was a question, however, whether it would survive intact a reportedly skeptical Senate committee.

DMET Is OK . . . but

Other short-range navaids can also be used, says ATA

Electronic equipment manufacturers pondering the logic of marketing airborne DMET (distance-measuring-equipment-Tacan) for airline consumption now have a lengthy, if not clear-cut, yardstick by which to judge how the carriers feel about it.

In a 10-point statement of airline views issued by Milton W. Arnold, v.p.-operations and engineering, Air Transport Association, the airlines in effect support the need for distance-measuring capability (but not necessarily DMET) in future jet operations.

Point by point, here's how the ATA statement boils down the short-range navaid situation:

1. Standards for airways route widths and navaid facility spacings adopted by Air Coordinating Committee in September, 1957 are realistic.

2. Needs for position-fixing accuracy set by ACC can be "technically" met by 1965, but further demonstration of the operational practicability of these accuracies is needed. (CAA program of Vortac airways based on ACC action calls for 9-mile wide airways up to 15,000 ft.; 14 miles wide up to 30,000 ft. and 30 miles wide up to 75,000 ft. with Vortac facility spacings at 90, 180 and 360 miles respectively.)

3. Distance-measuring capability will be required to meet these route width and facility spacing requirements.

4. Use of distance-measuring equipment most appropriately meets the requirements for improved navigational capability as well as ATC purposes. However, analysis of various ways of meeting ACC accuracies indicates that other short-range navaid systems also can be used.

5. Many carriers feel DMET will be desired and a few feel it will be required for efficient and economic operation. Two airlines have already undertaken or intend to undertake procurement and installation of DMET in new jets and turboprops. One airline (presumably United) has indicated intent to install DMET in its entire fleet—piston and jet.

6. The very high cost of Vortac stems largely from the cost of Tacan. A single Tacan facility costs more than six times that of an original civil DME facility (roughly \$120,000 vs. \$20,000).

Civil users should not be burdened with user charges to pay for the Tacan portion of Vortac, but rather only that portion that would have accrued if the original civil VOR/DME system had been completed.

7. Whether or not airlines ultimately endorse DMET, this decision should be

preceded by a reasonable service test period to evaluate its operational worth and to assist CAA in exploring its practical accuracies for ATC system use.

8. Airlines feel DMET should be proposed for inclusion in the International Civil Aviation Organization's Annex X as a standard (such a move was defeated last year in Montreal) but that implementation should be on a permissive basis.

9. Airlines primarily are interested in the expansion and continued worldwide implementation of VOR. Addition of DMET may be logical where traffic densities or other factors dictate improved position fixing, but regardless of the international fate of DMET, the carriers want primary protection, encouragement and expansion of VOR.

10. Carriers are gravely concerned with the potential economic impact of being asked to use more than one type of short-range navaid facility, performing essentially the same function, in the same geographical location.

First Customers Get Their Two-Place Morrisey 2150s

Morrisey Aviation, Inc. has begun deliveries on its new two-place, all-metal aircraft, called the Morrisey 2150, which is now in production at the Orange County Airport, Santa Ana, Calif.

The first airplane went to Aero Sales & Service, Inc., a Fresno fixed base operator. Other early deliveries were to Bill Cheney, an American Airlines pilot based in Los Angeles, and Frank G. Jameson, president of Pacific Automation Products, Inc.

The new Morrisey 2150 is an improved successor to the Nifty 2000 previously developed by William J. Morrisey, former chief test pilot for the Long Beach division of Douglas Aircraft Co., who started his own company after his retirement from Douglas.

Powered by a Lycoming 150-hp engine turning a Sensenich fixed-pitch metal propeller, the Morrisey 2150 cruises at 135 mph and has a range of 525 miles on two wing tanks holding 17½ gallons of fuel each. Rate of climb is 1,450 fpm at sea level.

Gross takeoff weight is 1,817 pounds. With an empty weight of 1,125 pounds, the aircraft demonstrates a wide degree of flexibility.

The Morrisey 2150 incorporates a big flap and at 1,817 pounds can takeoff over a 50-ft. obstacle in 450 ft. Landing speed is 52 mph.

List price for the airplane is \$7,800, without radio. Price includes dual controls, dual brakes and sensitive altimeter. Morrisey hopes to accelerate production to 10 a month.

Grounded Jets

Like whales out of water, AA official tells IAS

The scheduled airlines not only have failed to solve the increasing problems of passenger and baggage handling, but have no appreciation of the problem and have not used the knowledge gained by other large transportation systems to lick it.

This, in essence, was the charge levied by one of the industry's top aeronautical engineers, American Airlines' William W. Littlewood, during the recent Institute of the Aeronautical Sciences' meeting in Los Angeles.

Once the passenger is at the airport, the AA v.p.-equipment research notes, he is faced with the serious problem of conveying himself, his friends and relatives, and often his luggage, incalculable distances to ever-remote ramp positions.

And if by some chance he has come to the airport by auto, Littlewood adds, the inconvenience of parking is so great as to emphasize how little thought is being given to the individuals who are paying the airlines' way and making their business possible.

Again in the "too little thought" department, he observes that the desirable parking facilities often are delegated to car rental agencies, various officials and airport employees. Other Littlewood observations:

- Too many airports are too interested in producing profits at the expense of service. Witness: one new airport with ticket offices near a high profit-making restaurant instead of near aircraft loading positions.

- Like whales on a beach, the aircraft is out of its element on the ground. A better balance must be reached between aircraft ground-handling time and passenger-handling time.

- Shorter taxi distances and high-speed taxiways are badly needed.

G. F. Maxwell, manager of Pan American's Pacific-Alaska Division, told IAS that longer and stronger runways hold the key to economical jet operations in international service. He estimates carriers may lose as much as \$1,500 for every 100 ft. of non-available runway when payload has to be reduced or fuel restricted by inadequate runways.

United Air Lines' v.p.-engineering, W. C. Mentzer said flight planning can be reduced to a "cut and dried" process by use of computers. He suggests working the problem backwards, using the assumption that for each pound of excess fuel aboard on landing, 0.4 lbs. of fuel had to be loaded solely to carry that single pound.

*Another in a series
on aircraft operation
and maintenance...
and why major service
organizations, like
the world's airlines,
use CHAMPION
SPARK PLUGS.*
*Noted aviation
authority reports on
LOCKHEED AIRCRAFT
SERVICE...*



the LAS word

by HERB FISHER

International aviation authority, veteran test pilot, author

Lockheed Aircraft Service is the largest and oldest company in the world devoted to the maintenance, overhaul and modification of all aircraft types. Its facilities are said to be the most complete in the industry.

Since its founding in 1938 as the service division of Lockheed Aircraft Co., LAS has processed more than 55,000 aircraft — helicopters to 4-engine airliners, single-engine jets to 10-engine bombers.

Eleven years ago, Lockheed's service division was incorporated as a separate but wholly owned subsidiary company—LAS—to provide even better service for Lockheed planes as well as independent service for all types of other aircraft. Today, LAS itself has two subsidiaries—LAS-

International and LAS-Overseas.

The accumulated technical experience of LAS is vested in four ultra-modern overhaul bases: at New York International; Oakland and Ontario, Calif.; International Airports; and Honolulu Airport.

LAS has pioneered complete engineering and manufacturing functions in several significant post-war developments:

First Constellation and DC-6 conversion to high-density interiors . . . The first U.S. military cycle-reconditioning program . . . First airline fleet maintenance and overhaul on a fixed-price-per-flight-hour formula . . . First helicopter conversion to scheduled passenger service . . . First major military jet maintenance pro-

gram . . . First major airframe conversion of radar picket aircraft . . . Maintenance and overhaul support of airline and military fleets on the Berlin and Pacific Airlifts . . . First B-26 conversion to executive aircraft.

Military and commercial aircraft serviced by LAS are flying in every corner of the world—over all oceans, deserts, jungles, the Antarctic. LAS-O follows up with world-wide technical assistance. LAS emergency teams repair damaged aircraft at accident sites anywhere.

LAS' customer roster since the war has embraced almost every major international air carrier flying into the United States, as well as

major U.S. domestic carriers and the Air Force and Navy, including the entire East Coast fleets of Airborne Early Warning aircraft. Overseas, LAS-O has assisted Japan in major aircraft and jet-engine overhaul programs, plus manufacture of T-33 trainers. A current technical assistance and materiel program involves Japan's 22-million-dollar manufacturing of anti-sub patrol aircraft.

In World War II, LAS operated seven major overhaul and modification installations, repairing 22,500 battle-damaged craft alone plus modifying and servicing thousands of others.

In the Korean War, LAS modified and rebuilt hundreds of planes.

This extensive variation in aircraft type and operational pattern by LAS



Herb Fisher

New 400-hour maintenance cycle for WV-2 Early Warning picket aircraft is performed at LAS-Honolulu, which has 27 shops.



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Navy P2V-7 is modified at LAS-Ontario for 100-below "Operation Deep Freeze" in Antarctica.

customers is testimony to the company's experience level and the ready adaptation of its personnel and facilities to individual maintenance requirements. In this, the Champion Spark Plug plays a vital dual role:

First, LAS services a great many of the major airlines of the world. In their exhaustive flight evaluations of every available spark plug, the airlines



Foreign and domestic commercial planes plus U.S. military aircraft are serviced at LAS-I, New York International, largest East Coast independent maintenance facility.

from traditional military maintenance programs, to provide the USAF with higher utilization and operational flexibility.

Among Lockheed's earliest service jobs were modifications for such aviation greats as Amelia Earhart, Lindbergh, Sir Hubert Wilkins. Recently, LAS "royalized" a plane for His Majesty Haile

Selassie, Emperor of Ethiopia, by installation of luxurious movable compartments—one of the most unusual conversion jobs in air transport history.

**CHAMPION SPARK PLUG CO.
TOLEDO 1, OHIO**

LAS-I Base Manager, said: "Our customers depend on the finest quality plugs for peak engine performance throughout a wide heat range, whether operating in dry desert heat, jungle humidity or severe Arctic cold."

Paul Kovac, Senior LAS-I Powerplant Engineer, said: "Plugs may be affected by anything that goes wrong with an engine. If a plug is out of heat range, if it has a tendency to pre-ignite or foul, schedule delays will follow. Champions have proven their excellent quality control on our test-and-flight-lines. They're mechanically strong and do not experience core nose ceramic failures. We've found Champion a quality standard in an industry that knows high standards."

LAS' unique service program — Equalized Maintenance, Aircraft Rotation, planned spare-parts inventory and fixed-price-per-flight-hour formula—assures commercial and military operators maximum flight utilization through minimum ground time. The LAS Equalized Maintenance plan was applied to Early Warning aircraft, a marked departure



J. L. "Pete" Peters (l), Flight Line Dept. Head, recommends Champions for cars and planes. His Champion-fired Thunderbird won 35 trophies. Pilot is Capt. Edward Schank, LAS-USAF Acceptance Officer.

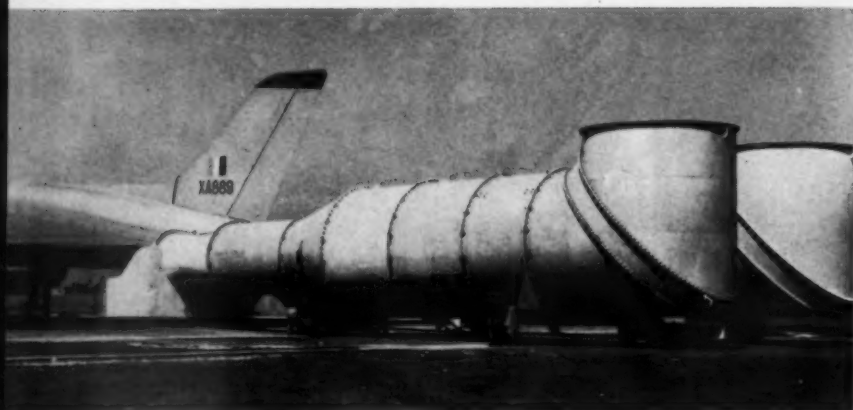


Fisher (l) interviews LAS President J. Kenneth Hull (r) and W. J. Weisbruch, Acting Plant Superintendent.

have repeatedly proved that Champions are best for reliability, service, economy. All the major airlines of the world fly with Champions.

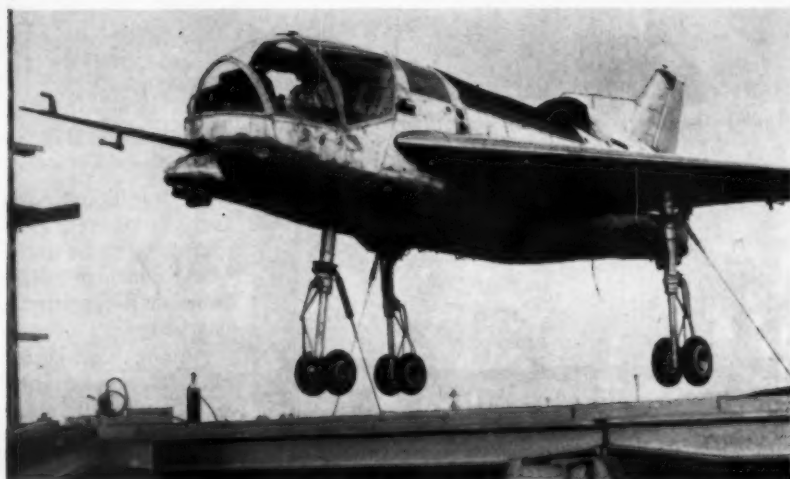
Second, as LAS President J. Kenneth Hull told me: "At LAS we must couple diversified know-how with only the finest first-line quality products in order to maintain our record of on-schedule deliveries of airworthy aircraft."

H. J. Chase, Vice President and



From Roar to Whisper

Designed to suppress the noise produced by the four 10,000-lb. thrust Bristol Olympus turbojet engines installed in the Avro Vulcan bomber, these two silencers are rolled into place sideways on rails set in a concrete base. Each muffler consists of two 54-ft. long, steel tubes which fit on the exhaust pipes on each side of the fuselage.



Flight on a Tether for Short's VTOL

Tethered to a specially built gantry, Short's SC.1 VTOL research aircraft is restrained during its first flight. Powered by five Rolls Royce RB.108 turbojet engines—four mounted vertically and one horizontally—the SC.1 is being prepared for full-scale tests. The gantry is being used for preliminary checks.



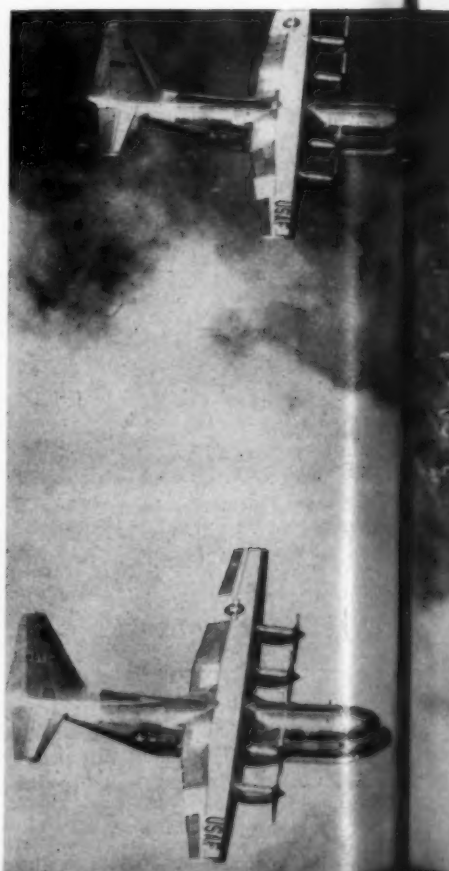
Short Brothers and Harland Ltd. photo

"Skeleton" Aircraft Aids VTOL Development

Rig for simulating control characteristics of Short's SC.1 VTOL research plane is supported by a spherical air bearing. Ducting and air jet control systems are the same as used in the actual aircraft. Air is supplied by either a modified Rolls Royce Avon or Nene turbojet engine housed in an adjacent building.

Splash and Slash

At speeds of 600 mph, raindrops have a velocity equivalent to that of a bullet fired from a .45-caliber pistol, says the B. F. Goodrich Co. Consequently, the company conducts rain erosion tests by applying rubber samples to the leading edges of the rotor in this 20-ft.-deep test cell. Spray nozzles emit streams of water which change to raindrops of controlled size.



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Flying Test Bed

Used as a flying test bed by Bristol Aeroplane Co., this North American F-86E is powered by a Bristol Orpheus 801 turbojet engine. Although the 4,850-lb. thrust Orpheus is less powerful than the General Electric 5,200-lb. thrust engine used in service, the aircraft performance should, in fact, be improved. The Orpheus is lighter by some 2,260 lbs.



Bristol Aeroplane Co. Ltd. photo



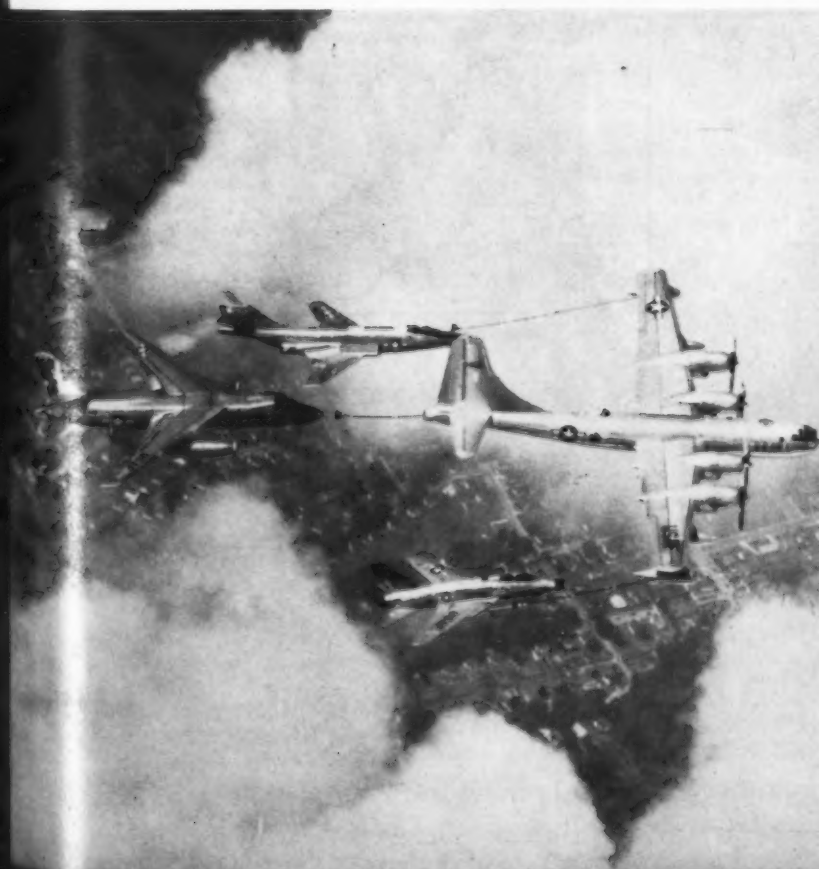
First Flight for Bristol 192

One of Europe's biggest military helicopters, Bristol's twin engine, turbine-powered Type 192 flew recently for the first time. The tandem rotor machine, designed for troop and freight transport, ambulance duties and search and rescue operations, is in production for the RAF.

"Small War" Package

Elements of Tactical Air Command's Composite Air Strike Force pose for a family portrait. A Boeing KB-50 is refueling a McDonnell F-101 fighter, a Douglas B-66 bomber and a North American F-100. Taking up the rear are two Lockheed C-130 turboprop transports. A composite Air Strike Force also uses the Douglas RB-66 reconnaissance bomber and the WB-66 "Flying Weather Station" version. This unique package of airpower may be varied in strength and composition, tailored to the situation; its tactical fighters and bombers are capable of delivering nuclear weapons.

←





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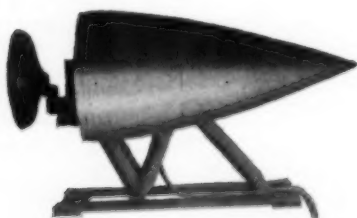
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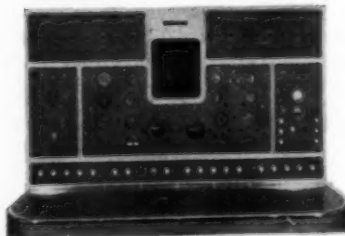


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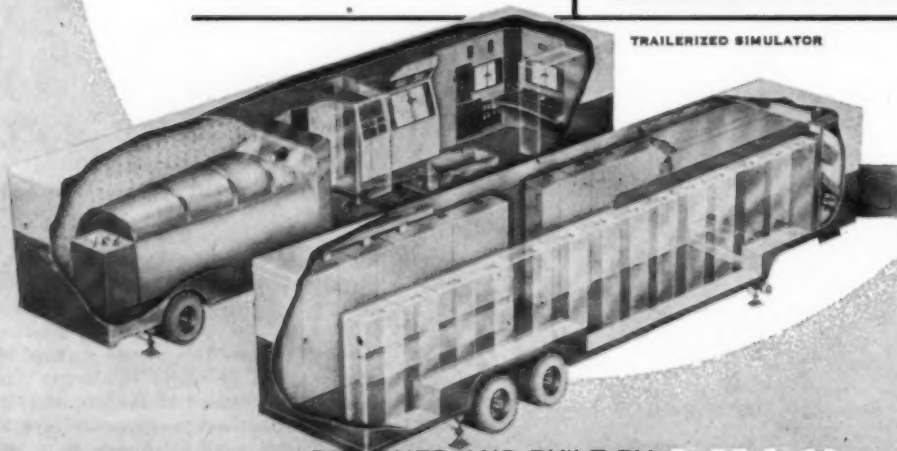
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Standard seat tears loose on impact . . .



. . . Aerotherm's energy absorption at work

Designing Aircraft Seats to Save Lives

By George Hart
Technical Editor

An air transport crashed. Before it skidded to a grinding halt, the fuselage split aft of the cockpit area. Several passengers were catapulted, still in their seats, out through the jagged hole ahead of them and were killed when the fuselage ran over them.

A tragedy? Much more of a tragedy than is at first apparent.

Why? Because this was a survivable crash. The cabin area remained reasonably intact and the primary cause of death was the failure of the seat tie-downs.

For years, those involved in aircraft accident investigation and safety engineering have realized that many accidents—particularly those occurring on the landing approach and as a result of aborted takeoffs—have taken a grim toll of lives when, in fact, they could have been survived. But, when seats are torn from the floor, they and their occupants become lethal missiles.

Aircraft cabin floors are designed to withstand seat tie-down loads to a minimum of 9Gs. Some experts consider this capacity unrealistic in the light of loads experienced in survivable crashes. But a 9G floor represents an improvement over older requirements and, if the floor were made strong enough to take the maximum load which could be expected in such a crash, the weight penalty would be tremendous.

• **Energy absorption study**—Realizing this, Aerotherm Corp. of Bantam, Conn., a key competitor in the field of aircraft seat design, turned to the study of energy absorption. Some four years

ago, O. C. Brewster, acting as a consultant, started working with the company's engineers on the problem of how to design a seat which would "give with the punch" so that the load applied to the floor would not exceed its breakaway point.

But the stumbling block, according to Aerotherm's president, R. A. Lautier, was that nobody knew just what degree of force would be applied in a survivable crash.

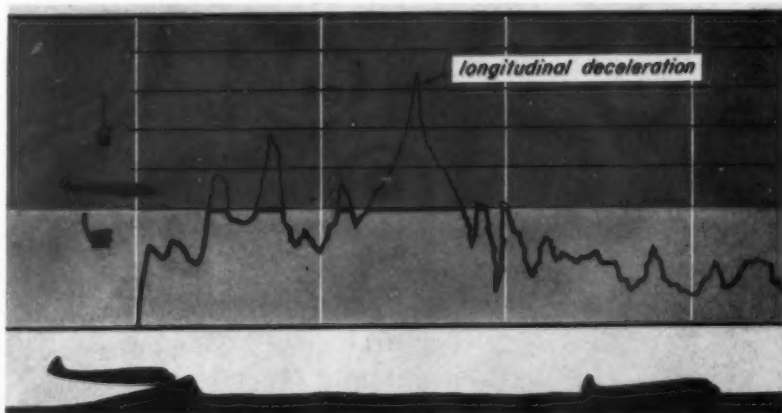
The break came in 1956. National Advisory Committee for Aeronautics' Lewis Flight Propulsion Laboratory published the results of a series of crash tests it had made using full-scale, fully instrumented transport aircraft. Also, in 1956, Aviation Crash Injury Research of Cornell University under its director, A. Howard Hasbrook, issued a technical paper detailing Av-

CIR philosophies relative to the design of passenger seats and aircraft tie-down structure.

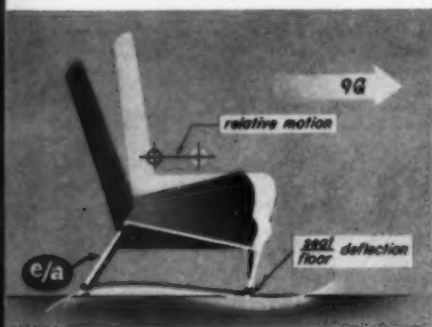
Hasbrook defined a survivable crash as one having a load spectrum of: 150-kt. impact speed; 15° nose down angle; 45° downward to 15° upward resultant crash force angle; 30° yaw angle; 30° roll angle; landing terrain comparable to a reasonably level plowed field.

Armed with the NACA test results and the Cornell findings, Aerotherm's Brewster was able to tackle realistically the problem of how to make a seat absorb sufficient energy to give passengers a fighting chance in a survivable crash.

About February of this year, Aerotherm demonstrated the final hardware of their energy absorption (e/a) system for aircraft seats. At this time,



AIRCRAFT DECELERATION in a survivable crash is represented by thin line with major peaks at 12, 15 and 19 Gs. Heavy line is loading condition on e/a seat set to peak at 9Gs for discussion. White lines denote .1 second time intervals.



FORWARD MOVEMENT and acceptance of floor deflection result in energy absorption to promote crash survival.

details of the system rank as "company confidential." It can only be said that crash energy is absorbed by the process of extruding.

An Aerotherm seat equipped with e/a has extendable rear legs—which house the e/a mechanism—and pivots about the floor attachment at the bottom of the front legs. The energy absorber is engineered to go into action at G loadings compatible with the floor strength of the various aircraft involved. This is related to passenger distribution.

For example, as designed for the Boeing 707, the energy absorber will operate at 9.15Gs in the six-abreast, high-density seating arrangement, at 10.8Gs in the five-abreast layout, and at 12.0G in the four abreast, first class arrangement. The seat structure incorporates a torsion bar so that, when a floor is designed to take a greater load through the outboard track than through the inboard track, the load to the floor is distributed accordingly.

When the load transmitted to the floor reaches the setting built into the energy absorber, the rear legs extend and the seat moves forward until the energy absorber has reached the end of its travel or until the load is reduced below the built-in value. The time for which e/a will be effective

depends, of course, upon the amount of force applied and the length of time for which that force is acting.

• **Six inches makes the difference**—Aerotherm allows the e/a seat to move forward a maximum of six inches. This figure was selected as the result of extensive studies of the loads imposed during survivable crashes. It is also based on considerations such as the desire to stop the passenger traveling forward enough to strike the seat in front of him.

The company has tested its e/a system in its fully instrumented laboratory. But the most convincing tests are those which are purely comparative. Seats are mounted on a trolley which is allowed to roll down inclined rails into a concrete abutment. Passengers are represented by 170-lb. weights strapped into place.

In a typical test, a seat which did not incorporate e/a was launched from a height of four feet. When the trolley hit the concrete, the seat was torn from its tie-downs and took off like a rocketing pheasant.

A seat equipped with e/a—but otherwise identical—was rolled from a height of nine feet, lurched forward slightly when the trolley hit the abutment, and then settled back. The tie-downs held fast. The company estimates that, in these tests, seats equipped with e/a have survived decelerations of more than 150Gs.

Discussing design factors affecting survival, Av-CIR's Hasbrook says in his 1956 report that the cabin floor must not fail prior to complete collapse, disintegration or the tearing free of major components of the aircraft. There can be no doubt that the application of an e/a system between passenger and floor is a major forward step.

Designing safety into seats doesn't end with e/a, however, and Aerotherm spares no effort in developing other features aimed at bringing the passenger through a survivable crash.

If the floor of the cabin wrinkles in the crash and the seat is attached rigidly, the chances are that, whether or not e/a is installed, the seat will be twisted free at the tie-downs. To overcome this, the company pivots the bottom of each rear leg as well as that of each front leg. Now, the seat absorbs energy in another dimension.

Lastly—but of equal importance—there's the structure and upholstery of the seat itself to be considered.

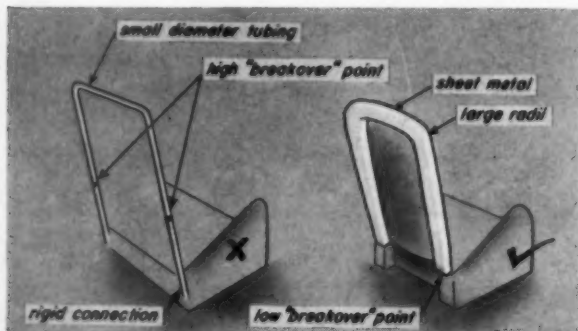
If a tubular construction seat starts to disintegrate and the tubes break, experience shows there's a very good possibility that the occupant or those around him will be impaled. The latest Aerotherm designs make use of tubing only under the seat. The back and arm rests are made of aluminum sheet.

This type of construction affords considerably more protection—not only because it is better able to absorb a blow either from its own occupant or from a flying object, but also because, if it does collapse, it's not likely to pierce.

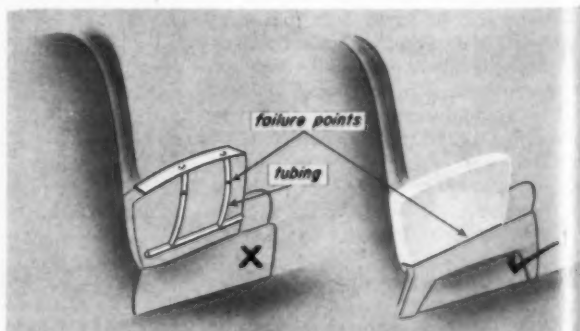
• **Softness doesn't always help**—As far as upholstery is concerned don't think that the softer something is the less chance of getting hurt when you hit it. Foam rubber comes in varying densities and Aerotherm applies foam rubber scientifically. The more dense the rubber is, the more energy it will absorb. So, between the aluminum sheet and the soft foam rubber next to the passenger, there may be a denser layer.

Aerotherm demonstrates this philosophy by dropping a steel ball on a piece of soft foam rubber and again on a denser piece. The ball bounces higher from the softer piece because the denser piece absorbs more energy.

So, boiling all this down, the seats to be installed in many aircraft soon to go into operation feature the ability to absorb energy. And, if someone tells you a cabin seat has e/a, he doesn't mean eye appeal—though this could apply—he means energy absorption.



DELETHALIZATION of seat back structure is accomplished by substituting aluminum alloy sheet for tubular framework.



ARM RESTS have been known to inflict fatal wounds in a survival crash. New procedure is to use aluminum sheet.



SNECMA'S C 450 COLEOPTER is positioned for vertical takeoff by transportation trailer. Note sighting windows in floor and sides of cockpit.

Turbojet Now, Ramjet Later

Due to fly in September SNECMA's jet-powered coleopter is backed by the West German government to the tune of about \$5 million.

It's understood the French company's contract with West Germany calls for testing of the novel aircraft through the experimental stages.

Operational development of the aircraft would be the responsibility of Focke-Wulf.

The flight program for the C 450 coleopter will start with hovering tests followed by transitioning flights. At present, there are no plans to equip the aircraft with any sort of temporary landing gear to flight-test horizontal control characteristics prior to transitioning.

Hovering phase of the test program is not expected to require much time

because the hovering control system was tested in the company's "Flying Atar" project.

Hovering stability of the coleopter is controlled by an autopilot which monitors a pneumatically activated jet deviation system.

Development plans for the first aircraft include installation of a more powerful engine. Later, ramjet power will be added to make the coleopter a mixed-powerplant machine. Reportedly, the annular wing will form the outer envelope of this ramjet.

Power for the C 450 is provided by a SNECMA Atar E5V turbojet engine rated at 8,155 lbs. thrust.

Range, speed and dimensions are classified at this time. However, it's estimated that the gross weight runs about 6,700 lbs.

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Positions of technical leadership available for:

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(Airplanes, Missiles and Helicopters)

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Airborne Radar	Auto-Pilots
Missile & Airplane Check Out Equipment	

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THERMODYNAMICS ENGINEERS

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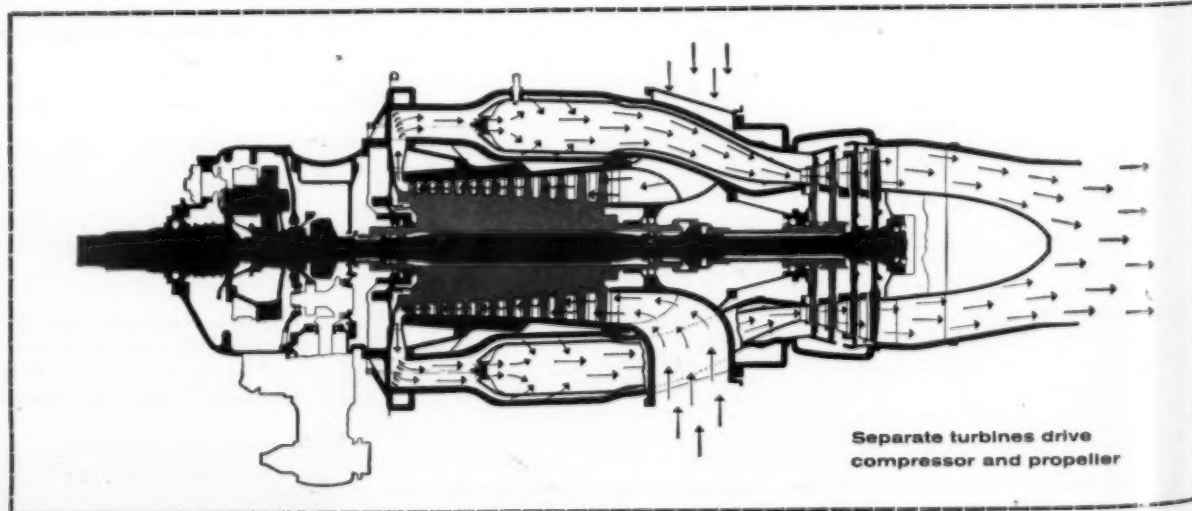


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It is installed in the Bristol Britannia—currently setting new standards of vibration-free comfort on record-breaking transatlantic and Mexico City–New York schedules.

Unique advantages. The Proteus is unique in having the Bristol-pioneered free-turbine system. This system gives high efficiency over a very wide range of operating conditions with a low specific fuel consumption—lowest of any gas turbine in service, military or civil. In addition, because it allows low propeller speeds, the free-turbine system results in an exceptional degree of quietness . . . starting is easier and control systems are greatly simplified.

Magnificent reliability. The Bristol Proteus has a magnificent record of mechanical reliability. The 705 version started airline operation with an overhaul life of 500 hours. As a result of its performance in service, the overhaul life has already been officially extended to 1,300 hours—in just thirteen months of operation—the most rapid increase in airline history.

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400 PARK AVENUE, NY 22, NY



"Packaged Maintenance" Keeps 'Em Flying

by Fred S. Hunter
West Coast Editor

Twenty-four-hour continuous flying for a limited fleet of aircraft is not what is expected of the nation's airlines but it is the flying mission of the Airborne Early Warning units of the Air Force over both the Atlantic and the Pacific Oceans.

Two wings of the Air Defense Command, the 551st and 552nd, have been flying missions over these areas for three years, using the Lockheed Flying Radar stations, RC-121s, a souped-up version of the Lockheed Super Constellation. These planes carry more than five and one-half tons of radar and electronic gear, and fly hundreds of miles out over the Atlantic and Pacific Oceans, where their 21-man crews can "see" for vast distances and spot electronically any ship or aircraft approaching the North American Continent.

Originally designed for the Navy for its vital mission of covering the fleet in

strategic areas, the aircraft received the intense scrutiny of many units of Air Force procurement when they were assigned the job of "flying out to sea to buy time" on both the east and west coasts.

Lockheed Aircraft Corp. and Lockheed Aircraft Service, Inc., a major subsidiary which specializes in the maintenance and overhaul of commercial and military aircraft, teamed in their approach to the Air Force.

• Lockheed team makes pitch—A Lockheed team, consisting of Walt Snyder, Dick Pitkin and Henry Rempt, spent many hours visiting bases, squadrons, WADF, EADF, Project Groups, Plans and Requirement Groups, and finally the Pentagon, in an effort to acquaint Air Force personnel with the attractiveness of the RC-121 maintenance package which they were offering.

In brief, Lockheed was suggesting for this mission a sales kit consisting of an adaptable and flexible aircraft with a

built-in maintenance organization, already staffed with men of high skills in the airline philosophy of progressive or equalized maintenance and which was readily transferable to these aircraft.

The LAS program of equalized maintenance is peculiar to the airlines but has been refined greatly by the varied experiences of LAS technicians in many parts of the globe.

It is aimed at developing maximum utilization of a fleet of aircraft by the use of:

- A detailed, worked-out maximum utilization plan.
- An aircraft rotational plan.
- A planned spare-parts inventory, in conjunction with Air Force Supply System.

Equalized maintenance is a system of distributing inspections, services, component replacements, etc., in such a manner as to eliminate protracted lay-ups of aircraft at any time within the maintenance cycle.

The objective is maximum utilization



ing Day and Night

of aircraft, with due regard for the missions of these squadrons and limited budgets. Goal is achieved by efficient utilization of ground time, taking advantage of all the hours the aircraft will be in the Service organization hangars. This works in accordance with a fixed, well laid out maintenance schedule, based on mission requirements.

The airmen seemed interested.

Squadron level maintenance was being threatened because of loss of skilled personnel as their enlistment time expired. Budgets were being slashed and units were not able to retain the skilled civilian personnel which they had for this kind of maintenance. The complexity and quantity of the radar and electronic gear was posing problems for low-manned organizations.

The first ships from Otis Air Force Base were placed on schedule at the Lockheed Aircraft Service-International base at New York's International Airport, March 2, 1955.

(Continued on Page 37)



NEW DE-ICER BOOT is installed on wing of RC-121. It's one of many maintenance items covered in LASI's contract with Air Force.



ENGINE INSPECTION is covered in Lockheed's maintenance and modification contract with Air Force for maximum utilization of AEW aircraft.



CREW CHIEF personally goes over many maintenance items on RC-121 as it prepares to depart on regular Aircraft Early Warning service mission.

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• **Why Air Force liked idea**—The philosophy originally expressed was attractive to the Air Force for several reasons: the high cost of the equipment involved; the availability of modern, well-equipped hangars, ground-handling equipment plus many skills.

Also, it was obvious that this mission, something which had never been done before, would require some types of revolution in many directions, including maintenance. Therefore, it was necessary to develop a maintenance system which would yield as high utilization factor for these aircraft as could be obtained.

The maintenance system was to be of such a nature that it would have to fit the military system and be compatible with Air Force regulations and specifications.

Two years' experience at LASI has convinced the 551st AEW&C Wing that an outside contractor has developed a package of merchandise which is a true air line maintenance system adaptable to USAF AEW&C operation.

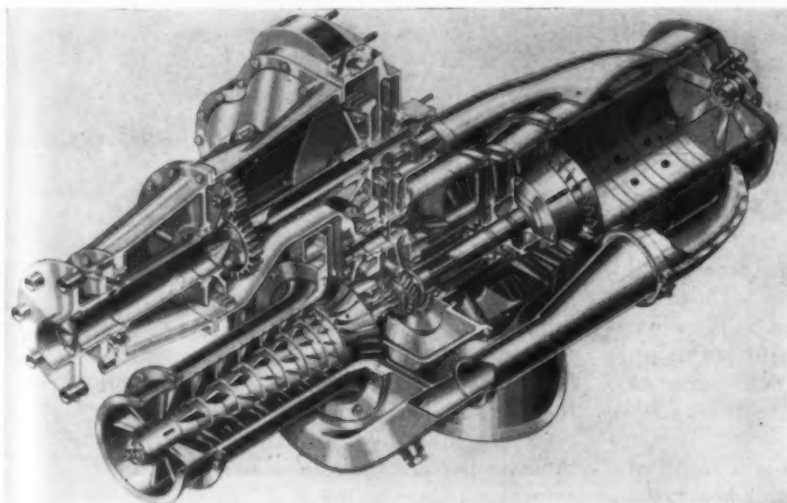
For example, Aircraft A, flying out of Otis AFB, Massachusetts, has completed its mission and has accumulated 650 hours flying time from the last check. It is input to LASI and the aircraft receives an intensified 5- to 9-day period of inspection and progressive

maintenance.

This differs from DIR or IRAN maintenance, usually done at the Air Force Depots or at plants, in that this type of maintenance is accomplished at periods of 1,000 to 2,000 cycles or 12- to 24-month cycles. These periods of maintenance require the aircraft to be de-activated from 40 to 150 days and therefore are lost to the using commands for this time. Also, it has been found that during this period technical orders or specifications are not always complied with, and in some instances, two years pass before certain technical orders are carried out.

The LAC-LAS package allows the aircraft squadron maintenance as well, but at no time is the aircraft ever out of service for more than ten days. In that period it is also possible for the contractor to accomplish specs and technical orders. The advantages:

- At no time is there ever any great number of planes out of service.
- The aircraft is kept in a constant and higher state of readiness.
- The system is one of true preventive maintenance with emphasis on constant inspection and low cost, and with high utilization.
- High-skilled technicians with long experience on these aircraft are doing the work.



Allison Division photo

The Winner of Army's 250-hp Competition

First view of Allison's new 250-shp Model 250-B2 turboprop engine (American Aviation, July 14, p.29) shows unique layout designed to promote ease of maintenance. Winner of Army's recent 250-shp turbine engine design competition, the engine features lightweight construction and employs advanced methods of fabrication, the

company says. The single can combustor is the same type as that used on Allison's T56 and 501-D13 turboprop engines. Minor changes convert the Model 250-B2 to the Model 250-C2 turboshaft version. The engine will be used to power liaison-type aircraft, utility helicopters and flying jeeps.

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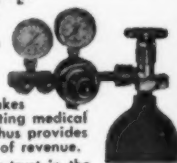
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JWT-LA 3678-6-26-58-American Aviation-Pg. B&W, (7" x 10")-July 28, 1958-

Circle No. 101 on Reader Service Card.

AMERICAN AVIATION



—WEST COAST TALK—

By Fred S. Hunter

Strange, sometimes, how fast the scene changes in the aircraft business. Take, for example, North American Aviation. In the early months of 1957, NAA was booming along with operations at the highest levels in the company's history. Then in July came the *Navajo* cancellation, costing \$15 million a month in revenues in one devastating blow. A personnel cutback of 20% or more followed and NAA stock plunged to a low around \$22. If this wasn't actually the beginning of the recession, it was a reasonable facsimile thereof as far as the Los Angeles area was concerned.

But here we are only a year later and financial people tell us NAA is one of the more promising long-term speculations. Earnings for 1958 are estimated at \$2.75 to \$3 per share, which compares with \$4.22 in 1957, but they will be ample to cover the present 40¢ quarterly dividend. The stock, at this writing, is up over \$30. And down the road is the profit potential of such promising articles as the six-jet B-70 bomber, the long-range F-108 interceptor, the GAM-77 air-to-surface missile, the UTX trainer, and the new alliance with Phillips Petroleum in the solid propellant field, Astrodyne.

• **About successors to 707s & DC-8s**—It's becoming apparent, in view of aerodynamic developments, that the successor to the Boeing 707 or Douglas DC-8 is going to be Mach 2 or 2.5. But we wonder how many seats an airline will have to have in a 1965—or should we say 1970—airplane to make a profit with it? Personally, we're more fascinated by Hall Hibbard's VTOL ideas—40 or 50-passenger jobs flying 45 minute schedules between downtown Los Angeles and downtown San Francisco on half-hour schedules throughout the day. A series of GE J79s to provide the thrust for VTOL and ram-jets for forward flight. The cost per seat-mile should be no more than present Constellations, says the Lockheed executive. But we wonder if he is taking into account how much an airline might have to pay in landing fees at a downtown spot?

• **What about polar routes?**—The Polar Routes of Pan American, SAS and

TWA have diverted substantial amounts of revenues from the domestic trans-continents, notably American Airlines, but now what do you suppose will happen to Polar Route revenues when AA and Pan Am begin operating their jets? There will be a period of some duration in which AA will have Boeing 707s flying between Los Angeles and New York and Pan Am will have the same equipment crossing the Atlantic between New York and Europe while Polar Route schedules are still being operated with piston equipment. Both AA and Pan Am are scheduled to launch jet service on these routes on the same day, Nov. 1, and we'll be mightily surprised if they don't get together on schedule connections.

• **X-15 to use X-1 engines for tests**—

Since the rocket engine Reaction Motors is developing for the X-15 will not be ready in time, North American will make the first flights of the high-altitude research vehicle with two engines of the type RMI developed for the Bell X-1. These engines will suffice for the initial trials to be flown by NAA's pilot, Scott Crossfield, but that's about all. The two X-1 engines will deliver 12,000 lbs. thrust total. The engine RMI is developing for the X-15 will produce about 60,000 lbs. thrust.

• **\$400 million riding on DC-8**—When you play for big stakes you have to use big chips. Douglas, which now has \$250 million invested in the DC-8, will be up to \$400 million next year. It will be 1960 before income begins catching up with outgo on the DC-8. Douglas, undoubtedly, will build up to a favorable profit position on the DC-8, but it will have to go some to match the DC-6/7 series now phasing out. More than 1,000 of these transports have been delivered at an average price of \$1.7 million, and that adds up to a lot of moola.

• **Hill AFB runway third longest**—The new runway at Hill AFB, Ogden, Utah, is the third longest in the U.S., 13,500 ft. Edwards AFB, of course, has the longest with its 22-mile dry lake bed. SAC's Fairchild AFB near Spokane is 13,600 ft. . . . Three financial houses, J. Barth, Dempsey-Tegeler & Co., and Francis I. duPont & Co., have recently issued favorable reports on Lockheed Aircraft Corp.

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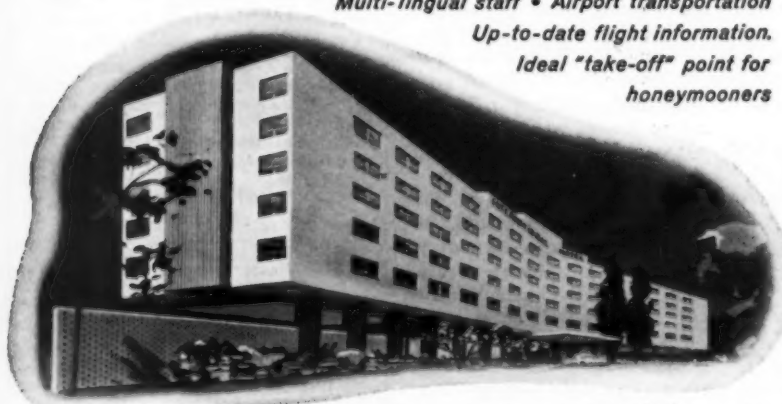
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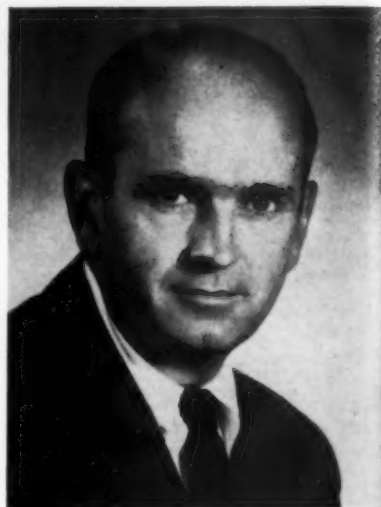


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—PEOPLE—



Richard M. Johnson

Koehler Aircraft Products Names Johnson President

Richard M. Johnson has been named president of Koehler Aircraft Products Co., succeeding R. T. Firsbie, retired.

Formerly vice president and general manager of the company, Johnson has been associated with the Chandler-Evans Division of Niles-Bement-Pond Co.

Dr. Edward P. Warner, ICAO Official, Dies

Dr. Edward P. Warner, an outstanding figure in aviation for the past 45 years, died of a heart attack recently at the age of 63.

Educated at Harvard University, where he received B.A. and B.S. degrees, Dr. Warner was responsible for much of the preliminary work that resulted in the formation of the International Civil Aviation Conference in 1944. He served as president of the ICAO provisional council from 1945 to 1947 and was president of the permanent body until his retirement last year.

A recipient of many honors in this country and abroad, including the Gold Medal of the Federation Aeronautique Internationale in 1952, Dr. Warner was largely responsible for the international collaboration in the establishment and maintenance of facilities for airways and the development and regulation of civil air transport. He is survived by his wife, two children and two brothers.

AMERICAN AVIATION



Charles S. Thomas

Charles S. Thomas Elected President of TWA

Charles S. Thomas, former Secretary of the Navy, has been elected president and a director of Trans World Airlines, Inc. He succeeds Carter Burgess, who resigned last January. The announcement was made by Howard Hughes, president of Hughes Tool Co., of which TWA is a subsidiary.

Thomas has had long experience in both Naval aviation and the aircraft industry. In January 1953, he became Under Secretary of the Navy. Later that year he was named to the office of Assistant Secretary of Defense for Supply and Logistics, which post he held until May 1954, when he was appointed Secretary of the Navy, serving in that position for three years.

Before being named president of TWA, Thomas was a member of the board of directors of Lockheed Aircraft Corp. and of Borg-Warner Corp.

People on the move in . . .

. . . Manufacturing/Military

J. R. Dempsey has been appointed vice president of Convair Div. of General Dynamics Corp. He will also continue as manager of Convair's Astronautics Div.

James W. Marshall has been appointed director of military contracts for Kaman Aircraft Corp. He also retains his position as assistant vice president.

W. A. Benson has been named JetStar project manufacturing manager of the newly-formed JetStar Manufactur-

ing Division at Lockheed Aircraft Corp.'s Marietta, Ga. plant. A graduate of the University of Alabama, Benson has held positions in all levels of production management with Lockheed.

. . . Transport

Morris Shipley, former assistant vice president in charge of American Airlines' Washington, D.C. office, has been transferred to New York to head American's new State and Community Affairs Department. Succeeding Shipley is

Dwight D. Taylor, formerly Shipley's assistant for legislative affairs.

Riddle Airlines has named **Edward T. Thompson, Jr.** senior vice president and treasurer. Thompson joined Riddle as financial advisor to the president in March.

K. C. Jones, United Air Lines' director of public relations, has been elected chairman of the Air Transport Assn. Public Affairs Committee. He was previously vice-chairman of the group.



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Airline passengers are off to a good start when they board a plane whose interior has been air conditioned by a new Hokanson H-35 self-mobile ground unit. Northwest Orient Airlines is the latest to assure passenger "comfort zone" cabin temperatures regardless of outside weather with a Hokanson H-35. It has 67% greater cooling capacity than any other mobile unit—a full 35 ton refrigeration rating—yet requires less capital investment and lower operating costs. Included in 20 new features are a trouble-free dry type condenser, and a heavy-duty engine which both propels the vehicle and drives the equipment. It is built by the nation's leading exclusive manufacturer of aviation ground air conditioning equipment.

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Aerial Applicator

Swathmaster dispensing unit for Stearman PT-17 spray planes is designed by Transland Aircraft to spread any dry or liquid materials at a swath width of from 33 to 100 ft. Self-contained 115-lb., CAA-approved unit permits a single airplane to dust, spray, seed or fertilize, changing from job to job by resetting pilot control in a few seconds, according to the manufacturer. Emergency dumping of liquids is said to be accomplished in 3 to 5 seconds.

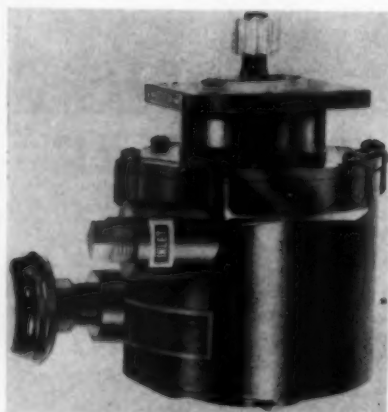
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Miniature Gas Turbine

Miniature gas turbine power package by AiResearch Mfg. Div. of The Garrett Corp. is said to be adaptable as a power drive for generators, alternators, liquid pumps, freon and air compressors. The 30-shp unit weighs 45 lbs.

Circle No. 157 on Reader Service Card.



Dry Vacuum Pump

Newly designed Model K-1163 dry vacuum pump by Aircraft Components, Inc. is said to have ample capacity for artificial horizon, directional gyro, turn and bank, and autopilot. Operating without lubrication, it requires no venting, additional accessories or fittings. Unit is CAA-approved for original or replacement installation and fits standard aircraft engines, according to the company.

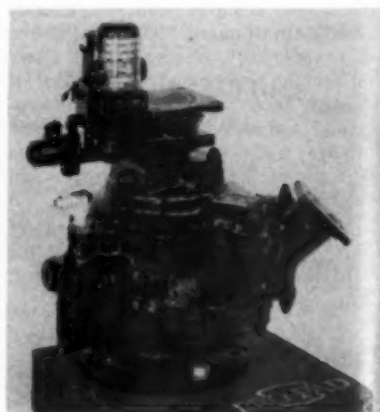
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Mach Calibrators

Burton Mfg. Co. has received a contract for its portable Mach calibrators, to be used for ground support of the Republic F-105. Compact (18" x 16" x 11 1/4") unit weighs 60 lbs. complete with pumps, regulators, Mach number and air-speed indicators, and altimeter. Designed to stimulate speeds and altitudes, it is used to check out pitot and static systems and instrumentation.

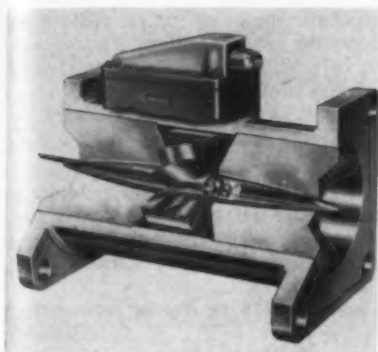
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Water Pump

Designed by Chandler Evans Co. for the water injection system of jet aircraft powerplants, CECO Model 9753 water pump is said to deliver 90 gpm at 400 psi, operating at 6,200 rpm. Unit incorporates a boost impeller, vortex element, relief valve and drain valve to prevent icing. Pump is designed to continue operating after takeoff without benefit of water as lubricant or coolant.

Circle No. 156 on Reader Service Card.



Flowmetering System

Developed by Revere Corp. of America, flowmetering systems provide both rate and totalizing indication. Featuring pressure drop of less than 2.5 psi and transmitter accuracies of $\pm 1\%$ over ranges from 3 to 600 gpm, units are designed to accommodate a variety of hydraulic and special fluids.

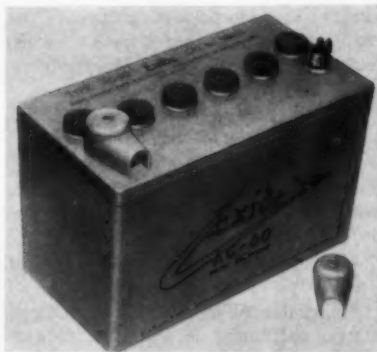
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Metal Thermometer

Self-contained 3" x 8" probe by Royco Instruments, Inc. weighs 40 oz. and provides positive, reproducible temperature measurements on metal surfaces. Universal metal measurements are obtained through use of a conversion chart. Dial has linear scale and readings for automatic room temperature compensation.

Circle No. 161 on Reader Service Card.



Lightplane Battery

Developed by Exide Industrial Div. of the Electric Storage Battery Co., Model AC-60 features 13 plates per cell, all-plastic container. Battery incorporates a gas-diffusing vent plug which retains electrolyte. At an electrolyte temperature of 0°F, it delivers 160 amps at the critical three-minute starting rate.

Circle No. 158 on Reader Service Card.

Speed Kit for DC-3

Maximizer kit by The Garrett Corp.'s AiResearch Aviation Service Div. is designed to increase speed by 20 mph without any increase in power. Kit includes improved, contoured baffles with interrelated engine cowl, "Siamese" exhaust system, diffuser entrance fairing for oil cooler, wheel well doors and tail wheel fairing.

Circle No. 153 on Reader's Service Card.



Aluminum cleaner and polish—Developed by German chemical industry, Met-All by Anton Co. is said to restore to chrome-like finish aircraft aluminum skin which has been exposed to dirt, grime and oxidation.

Circle No. 159 on Reader Service Card.

Windometer—Three-dial unit consisting of wind-speed indicator, direction indicator and barometer, mounted in 14" x 6½" x 7" blond and walnut wood cabinet, coupled electrically to outdoor brass and aluminum weather vane and rotating cups, offered by Aircraft Components, Inc. Wind speeds from 0 to 100 mph and 0 to 85 knots are calibrated to an accuracy of $\pm 2\%$. Magnetically coupled transmitter operates on 110v ac.

Circle No. 160 on Reader Service Card.

Air-actuated vent valve—Designed to work with all aircraft fuels, an air-actuated vent valve by Aero Supply

Mfg. Co., Inc. controls fuel-level sensing without floats. Valve permits free flow of air in both directions when fuel-level sensing device is exposed to air. Normally closed when sensor is submerged in fuel, valve will open to relieve tank pressure over a set value.

Circle No. 173 on Reader Service Card.

Rudder-pedal link—Developed by Pacific Scientific Co., a rudder-pedal adjustment link consists of a spring-loaded sliding shaft which extends when dual locking collars are released. Normally locked, collars are unlocked by application of power to a solenoid. Link can be applied to control locks and seat adjustments, manufacturer says.

Circle No. 174 on Reader Service Card.

Blade antenna—L-Band blade antenna designed to operate in the 950-1250 mc band for use with communication and navigation equipment installed

in high-speed aircraft has been developed by Canoga Corp. Designated Model 9926, the new blade antenna is 3.55" long, extends 1.7" from the skin of the airframe and weighs ¾ ounces.

Circle No. 175 on Reader Service Card.

Brake-control valve—A brake-control valve designed to work in pneumatic, hydraulic or combination pneumatic-hydraulic service is offered by Tactair Valve Div., Aircraft Products Co. The 3,000-psi valve has a forged aluminum alloy housing.

Circle No. 176 on Reader Service Card.

Servo filter—Developed by Aero Supply Mfg. Co., 45-micron unit operates on pressure of 1,000 psi and, according to the company, can be designed for pressures to 4,000 psi. Suitable for JP4 and JP5, unit has temperature range from -65° to 350°F ambient and -65° to 250°F fuel.

Circle No. 154 on Reader Service Card.

• **Steel Data**—40-page booklet describes investment-cast properties of eight stainless and four low-alloy steels. Included are applicable AMS specifications. Haynes Stellite Co.
Circle No. 162 on Reader Service Card.

• **Electronics Equipment**—55-page illustrated catalog provides a complete listing of the company's commercial product lines. Collins Radio Co.
Circle No. 183 on Reader Service Card.

• **Circular Slide Rule**—Pocket-sized, plastic calculator is available free of charge to engineers and executives. General Industrial Co.
Circle No. 163 on Reader Service Card.

• **Aircraft Propellers**—38-page, two-color catalog contains technical information on the company's products and includes a short history of the company plus photos of the propeller production line and factory repair division. The McCauley Industrial Corp.
Circle No. 164 on Reader Service Card.

• **AN Connector Chart**—Multi-colored wall chart measuring 22" x 28" provides contact information, service requirements, shell types and dimensions, pin positions and clocking arrangements at a glance. The Deutsch Co.
Circle No. 165 on Reader Service Card.

• **T58 Design Analysis**—Eight-page bulletin contains in full the paper by F. W. Heglund, manager of T58 Design Engineering, presented at the ASME International symposium in Washington, D.C. last March. Each engine component is described and a cross-section view of the engine is included. General Electric Co.
Circle No. 166 on Reader Service Card.

• **Aircraft Fire Extinguishing Equipment**—12-page brochure describes design and operation of nacelle fire extinguishing systems in conventional and jet-powered aircraft. Walter Kidde & Co.
Circle No. 167 on Reader Service Card.

• **Selenium Rectifiers**—4-page illustrated folder describes use of selenium rectifiers for arc suppression. Also listed are the physical and electrical characteristics of vacuum-processed selenium rectifiers for ac and dc use. Bradley Laboratories, Inc.
Circle No. 169 on Reader Service Card.

• **Jet Engine Silencer**—Illustrated brochure shows operation and use of portable, ground run-up silencer said to be adaptable for any type of commercial or military jet aircraft. Metal Products Div. of Koppers Co., Inc.
Circle No. 168 on Reader Service Card.

• **Electrical Connector Soldering Techniques**—10-page report gives step-by-step procedure for soldering of miniature electrical connectors. The Deutsch Co.
Circle No. 170 on Reader Service Card.

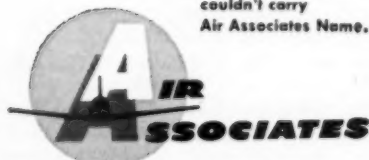
• **Hydro-Pneumatic Accumulators**—6-page brochure includes eight basic circuit applications for hydro-pneumatic bladder-type accumulators, dimensional data, selection information for hydraulic circuits requiring pressure storage, pressure-volume compensation, shock absorbing, etc. Greer Hydraulics, Inc.
Circle No. 171 on Reader Service Card.

• **Rare Metals**—4-page folder includes a quick-reference chart covering the properties and typical uses of 20 different types of rare or special metals. The Staver Co.
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STATISTICS

Summary of U.S. Airline Traffic for March 1958 vs. March 1957

Compiled by American Aviation Publications from Official CAB Data

Airlines	Revenue Passengers			Revenue Passenger Miles (In Thousands)			Total Ton-Miles Rev. Traffic			% Available Ton-Miles Used	
	1958	1957	% Change	1958	1957	% Change	1958	1957	% Change	1958	1957
DOMESTIC											
American	579,527	621,298	-6.7	384,425	401,876	-4.3	46,417,643	47,989,801	-3.3	54.1	57.0
Brantiff	175,477	167,808	4.6	75,085	70,413	6.6	8,140,004	7,465,192	9.0	46.3	46.7
Capital	325,487	303,743	7.2	126,845	115,149	10.2	13,274,653	11,830,708	12.2	45.5	46.0
Continental	44,833	43,579	2.0	29,085	23,312	24.8	3,047,138	2,441,015	25.4	43.8	46.8
Delta	231,396	233,463	-0.9	121,284	121,911	-0.5	13,239,316	12,956,584	2.1	50.5	57.0
Eastern	675,241	714,800	-5.5	407,414	442,180	-7.9	41,833,971	45,495,659	-8.0	50.6	45.7
National	151,406	156,853	-3.5	108,123	111,400	-2.9	11,494,409	11,794,373	-2.6	56.9	53.2
Northeast	69,360	43,761	58.5	38,116	11,239	239.1	3,900,482	1,153,456	238.2	41.2	36.5
Northwest	109,264	100,325	8.9	69,625	64,888	7.3	8,254,926	7,565,379	9.1	44.5	48.1
Trans World	358,872	344,849	4.1	277,587	255,071	8.8	30,245,777	28,517,718	6.1	53.5	52.2
United	541,024	472,260	14.6	370,342	339,516	9.1	43,925,944	39,873,892	10.2	56.7	53.1
Western ¹	629	106,882	.....	200	51,518	.....	19,021	5,484,572	.....	59.5	58.2
TOTALS	3,282,716	3,329,621	-1.4	2,008,151	2,008,553	0.0	223,815,304	222,568,351	0.6	51.5	51.3

¹ Western Air Lines pilots on strike. Traffic reported flown by supervisory personnel.

INTERNATIONAL											
American	12,192	13,288	-8.2	12,180	10,260	18.7	1,615,067	1,454,800	11.0	63.7	73.1
Brantiff	3,968	3,323	19.4	7,317	6,762	8.2	928,520	840,640	10.5	47.0	55.7
Delta	5,228	5,949	-12.1	6,111	6,544	-6.6	733,320	807,830	-9.2	45.7	51.1
Eastern, Overseas	28,388	23,098	22.9	38,200	30,718	24.4	4,165,894	3,346,738	24.5	55.1	56.5
San Juan	20,805	20,567	1.2	29,410	28,739	2.3	3,185,959	3,131,610	1.7	60.3	58.4
Bermuda	3,796	2,531	50.0	2,991	1,979	51.1	316,473	215,128	47.1	37.4	38.9
Mexico	3,787	.....	.....	5,799	.....	.....	463,462	.....	.....	46.5	.....
National	7,978	7,692	3.7	5,453	5,361	5.4	478,312	608,159	-11.5	37.7	49.8
Northwest	9,864	8,720	13.1	21,947	19,704	11.4	4,115,118	3,835,217	7.6	62.4	67.1
Hawaiian	1,841	1,436	28.2	4,978	3,868	28.7	551,183	435,241	26.6	67.2	60.9
Panagra	12,076	12,273	-1.6	15,930	16,582	-3.9	2,266,968	2,173,087	4.3	64.8	64.8
Pan American, System	199,407	218,216	-8.6	279,518	305,586	-8.5	39,752,500	42,654,649	-6.8	61.5	66.5
Latin America	95,132	115,931	-17.9	99,983	100,582	-0.6	14,510,352	14,550,935	-0.3	64.1	66.2
Atlantic	79,352	74,594	6.4	97,431	105,125	-7.3	13,936,187	14,613,639	-4.6	55.8	63.8
Pacific	22,114	23,195	-4.7	78,935	94,832	-16.8	10,782,955	12,755,081	-15.5	67.6	72.4
PDX/SEA-HON	1,610	2,182	-26.2	4,453	4,755	-32.7	513,472	724,610	-29.1	54.4	57.0
Alaska	2,807	4,494	-37.6	3,169	5,047	-37.2	523,004	734,994	-28.8	50.2	45.0
Trans Caribbean	3,421	.....	.....	5,320	.....	.....	442,205	.....	.....	86.3	.....
TWA	19,042	17,431	9.2	51,532	43,711	17.9	7,037,900	6,227,266	13.0	60.9	69.5
United	7,429	6,796	9.3	18,395	17,474	5.3	2,068,071	1,958,382	5.6	57.2	55.6
Western ¹	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
TOTALS	308,993	316,786	-2.5	462,103	462,702	-0.1	63,803,875	63,906,788	-0.2	60.3	65.3

¹ Western Air Lines pilots on strike in 1958; international route was not in operation in March 1957.

NOTE: Figures include both scheduled and non-scheduled operations. Data in the above tabulation were compiled by American Aviation Publications from reports filed with the Civil Aeronautics Board; figures for American are the carrier's service to Mexico, but not to Canada; for Braniff to South America; National to Havana; Northwest to the Orient and Hawaii; United to Honolulu and Western to Mexico City. Operations of U.S. carriers into Canada are included in the domestic reports to the CAB. Northwest and Pan American Hawaiian figures are shown for information only, individual carrier totals include Hawaiian service.

LOCAL SERVICE											
Allegheny	32,886	31,640	3.9	5,527	5,468	1.1	564,214	558,846	1.0	40.6	41.8
Bonanza	17,431	12,647	37.8	4,035	2,800	44.1	400,553	280,660	42.7	48.5	46.1
Central	10,147	8,878	14.3	1,927	1,729	11.5	176,759	179,527	-9.6	29.3	26.7
Frontier	20,069	16,280	23.3	6,258	4,502	39.0	679,531	519,043	30.7	62.8	54.6
Lake Central	13,832	12,265	12.8	2,185	1,772	10.8	223,408	202,003	10.6	35.5	40.4
Mohawk	34,200	32,947	3.8	6,356	6,133	3.6	636,232	617,176	3.1	49.5	49.0
North Central	56,763	52,141	8.9	9,158	8,281	10.6	930,051	836,572	11.2	46.1	51.7
Ozark	32,885	30,055	9.4	5,357	4,711	13.7	549,020	484,891	13.2	43.8	40.7
Pacific	31,040	24,922	24.5	7,002	5,361	30.6	689,822	530,505	30.0	50.8	49.8
Piedmont	28,809	30,608	-5.9	5,788	6,154	-5.9	585,997	623,179	-6.0	47.7	50.2
Southern	17,515	17,524	.....	3,144	3,117	.....	322,621	318,426	1.3	36.2	44.5
Trans Texas	19,015	21,451	-11.4	4,209	4,814	-12.6	448,743	503,655	-10.9	37.2	37.2
West Coast	20,048	18,620	6.5	3,734	3,396	10.0	371,574	335,312	10.8	44.7	43.7
TOTALS	334,640	310,198	7.9	64,680	58,438	10.7	6,598,525	5,990,595	10.1	44.5	45.0

ALASKAN											
Alaska	5,786	4,541	27.4	2,697	1,702	58.5	462,129	539,016	-14.3	41.0	44.0
Alaska Coastal	3,476	3,225	7.8	337	290	16.2	41,874	36,401	15.0	64.1	63.6
Cordova	970	1,392	-30.3	146	412	-64.6	23,995	110,438	-78.3	35.6	46.9
Ellis	3,133	3,332	-6.0	199	221	-10.0	24,041	26,660	-9.8	67.8	66.3
No. Consolidated	1,989	1,574	26.4	580	420	38.1	130,122	133,457	-2.5	57.7	58.0
Pacific Northern	6,492	6,098	6.5	5,463	5,484	.....	857,845	833,208	3.0	47.3	50.8
Reeve	725	377	92.3	548	322	70.2	154,957	62,753	146.9	46.2	50.0
Wien	1,554	1,377	12.9	483	411	17.5	232,507	396,860	-41.4	60.2	83.6
TOTALS	24,125	21,916	10.1	10,453	9,262	12.9	1,927,470	2,138,793	-9.9	47.6	53.1

HELICOPTER SERVICE											
Chicago	8,066	1,752	360.4	144	28	414.3	15,667	5,257	198.0	32.1	41.6
Los Angeles	2,287	2,150	6.4	91	80	13.8	14,659	13,876	5.6	56.3	59.1
New York	4,838	4,799	.....	94	89	5.6	11,664	.....	.....	39.6	40.2
TOTALS	15,191	8,701	74.6	329	197	67.0	41,956	30,797	36.2	40.3	47.3

TERRITORIAL											
Caribair	24,392	22,148	10.1	1,712	1,593	7.5	186,057	173,727	7.1	63.2	61.3
Hawaiian	23,822	29,892	-20.3	3,677	4,567	-19.5	419,704	509,735	-17.7	53.6	54.9
Trans Pacific	10,234	11,656	-12.2	1,409	1,698	-17.0	122,921	146,700	-16.2	50.4	55.3
TOTALS	58,448	63,696	-8.2	6,798	7,858	-13.5	728,682	830,162	-12.2	55.2	57.5

Summary of U.S. Airline Traffic for April 1958 vs. April 1957

Compiled by American Aviation Publications from Official CAB Data

Airlines	Revenue Passengers			Revenue Passenger Miles (In Thousands)			Total Ton-Miles Rev. Traffic			% Available Ton-Miles Used	
	1958	1957	% Change	1958	1957	% Change	1958	1957	% Change	1958	1957
DOMESTIC											
American	406,740	437,474	-4.9	393,554	405,757	-3.0	47,035,207	47,927,361	-1.9	54.4	59.6
Braniff	175,398	165,274	6.1	74,932	70,019	7.0	8,112,502	7,476,815	8.5	47.3	48.9
Capital	330,442	320,520	3.2	128,310	121,598	5.5	13,384,395	12,500,934	7.0	46.0	48.8
Continental	63,854	62,456	1.9	28,617	23,353	22.5	3,043,045	2,444,876	24.4	43.1	46.5
Delta	230,247	228,205	0.9	119,676	117,262	2.1	13,138,547	12,491,942	5.2	51.7	57.6
Eastern	483,165	701,994	-2.7	399,677	421,597	-5.2	41,040,142	43,325,729	-5.3	51.0	44.9
National	146,336	145,845	0.3	101,661	101,557	0.1	10,740,938	10,702,985	0.4	48.1	50.9
Northeast	74,607	46,083	55.2	38,440	13,413	188.1	3,945,430	1,354,430	191.3	42.0	40.3
Northwest	115,363	105,326	9.5	75,850	67,632	12.2	8,772,040	7,805,120	12.4	46.7	49.0
Trans World	374,884	345,035	2.7	292,592	272,571	7.3	31,529,946	29,950,107	5.3	55.3	56.0
United	547,549	490,284	11.7	380,497	345,359	10.2	44,587,080	40,465,547	10.2	56.5	54.4
Western ¹	497	104,526	.....	420	49,853	.....	39,868	5,314,444	.....	58.9	57.7
TOTALS	3,349,302	3,375,442	-0.8	2,034,426	2,009,973	1.2	225,369,378	221,760,290	1.6	52.1	52.6

¹Western Air Lines pilots on strike during this month. Traffic reported flown by supervisory personnel.

INTERNATIONAL											
American	9,855	11,310	-12.9	9,209	8,242	11.7	1,292,130	1,171,714	10.3	54.5	67.0
Braniff	3,492	3,042	14.8	4,427	6,520	-1.4	824,250	793,438	3.9	40.1	53.7
Delta	3,530	5,142	-31.4	4,450	5,943	-25.1	558,861	734,252	-23.9	38.7	49.0
Eastern, Overseas	29,557	23,213	27.3	38,928	30,776	26.5	4,202,844	3,326,159	26.4	57.5	48.9
San Juan	19,551	19,061	2.6	28,620	28,182	1.6	3,082,499	3,053,101	1.0	44.6	53.4
Bermuda	4,432	3,352	27.9	5,122	2,594	97.5	531,270	273,058	94.6	48.2	44.8
Mexico	3,374	.....	.....	5,186	.....	.....	589,165	.....	.....	41.0	.....
National	3,261	6,719	-51.5	1,948	4,621	-57.9	241,894	523,405	-53.8	23.3	44.5
Northwest	10,536	9,075	16.1	23,923	19,210	24.5	4,307,023	3,645,318	18.2	59.6	65.1
Hawaiian	1,733	812	113.4	4,690	2,101	123.2	524,448	264,396	98.6	65.7	41.2
Panagra	11,031	12,477	-11.6	12,448	15,446	-19.4	1,864,928	2,096,137	-11.0	56.8	62.2
Pan American, System	197,022	209,099	-5.8	286,142	303,695	-5.8	39,703,730	41,196,272	-3.6	58.9	63.9
Latin America	80,040	94,952	-15.7	86,433	96,942	-10.8	12,850,870	13,297,881	-3.4	59.6	60.3
Atlantic	92,123	86,213	6.9	113,516	108,152	5.0	15,139,558	14,572,793	3.9	52.9	63.5
Pacific	22,039	22,733	-3.1	82,978	93,124	-10.9	11,153,045	12,475,378	-10.6	48.7	71.3
PDX, SEA-HON	1,199	1,161	3.3	3,607	3,513	2.7	408,388	400,735	1.4	54.3	37.1
Alaska	2,820	5,201	-45.8	3,215	5,477	-41.3	560,257	850,220	-34.1	53.5	44.6
Trans Caribbean	4,231	.....	.....	4,805	.....	.....	576,424	.....	.....	78.8	.....
Trans World	24,241	20,379	19.0	61,749	46,541	32.6	8,047,540	6,407,133	25.6	51.6	71.6
United	6,631	6,452	2.8	16,474	16,171	1.9	1,876,322	1,836,028	2.2	55.4	55.3
Western ¹	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
TOTALS	303,387	306,908	-1.1	468,303	437,185	2.3	63,495,966	61,729,846	2.9	56.7	63.1

¹Western Air Lines pilots on strike; international route was not in operation in April 1957.

NOTE: Figures include both scheduled and non-scheduled operations. Data in the above tabulation were compiled by American Aviation Publications from reports filed with the Civil Aeronautics Board; figures for American are the carrier's service to Mexico, but not to Canada; for Braniff to South America; National to Havana; Northwest to the Orient and Hawaii; United to Honolulu and Western to Mexico City. Operations of U.S. carriers into Canada are included in the domestic reports to the CAB. Northwest and Pan American Hawaiian figures are shown for information only, individual carrier totals include Hawaiian service.

LOCAL SERVICE											
Allegheny	38,142	32,972	15.7	6,580	5,870	12.1	449,056	595,517	12.3	45.5	46.0
Bonanza	16,770	12,829	30.7	3,834	2,881	33.1	381,562	288,172	32.4	47.5	48.1
Central	10,647	8,729	22.0	2,048	1,717	19.3	209,324	176,551	18.6	30.6	27.6
Frontier	19,413	16,513	17.6	4,886	4,524	30.1	643,334	514,474	25.0	61.1	56.1
Lake Central	14,100	12,449	13.1	2,262	1,951	15.9	232,213	197,964	17.3	37.4	39.9
Mohawk	37,771	33,670	12.2	7,073	6,523	8.4	708,537	653,717	8.4	51.8	55.5
North Central	58,447	47,657	22.6	9,570	7,402	29.3	969,293	748,399	29.5	46.1	47.6
Ozark	34,074	28,742	18.6	5,579	4,555	22.5	569,488	470,441	21.1	45.0	41.4
Pacific	30,724	28,108	9.3	6,829	6,146	11.1	673,781	605,546	11.3	50.3	52.2
Piedmont	33,524	32,822	2.1	6,676	6,405	1.1	672,675	644,359	1.3	49.9	54.2
Southern	17,707	18,102	-2.2	3,202	3,169	1.0	328,134	321,937	1.9	37.3	44.6
Trans-Texas	18,600	20,429	-9.0	4,158	4,597	-9.6	444,604	479,985	-7.4	36.7	36.7
West Coast	19,732	19,939	-1.0	3,602	3,572	.8	357,303	351,457	1.7	43.4	46.5
TOTALS	349,651	312,981	11.7	67,299	59,512	13.1	6,859,304	6,068,539	13.0	45.8	46.6

ALASKAN											
Alaska	5,223	4,991	4.6	2,199	1,755	25.3	462,983	568,328	-18.5	38.7	41.7
Alaska Coastal	3,813	4,012	-5.0	357	344	3.8	44,768	43,038	3.8	67.7	61.6
Cordova	1,084	1,429	-24.2	121	494	-75.5	23,782	172,543	-86.2	43.7	43.1
Ellis	3,388	4,199	-19.3	204	231	-11.7	25,614	28,217	-9.2	70.7	70.0
No. Consolidated	1,344	1,256	7.0	464	418	11.5	128,670	124,117	3.7	56.0	60.7
Pacific Northern	7,266	6,755	7.6	6,504	6,221	4.5	1,001,373	998,708	.3	47.5	54.8
Reeve	963	545	76.7	685	415	65.1	206,081	73,771	179.4	50.0	36.2
Wien	2,368	2,083	13.7	839	648	29.5	269,729	506,004	-46.7	61.1	86.4
TOTALS	25,449	25,270	.7	11,375	10,526	8.1	2,162,910	2,514,726	-14.0	47.6	53.6

HELICOPTER SERVICE											
Chicago	8,417	2,416	248.4	151	36	319.4	16,315	5,752	183.6	33.0	32.0
Los Angeles	2,490	2,443	1.9	96	90	6.7	15,691	14,848	5.7	58.2	62.0
New York	6,235	4,816	29.5	119	88	35.2	14,382	11,055	30.1	43.3	42.4
TOTALS	17,142	9,673	77.3	366	214	71.0	46,388	31,655	46.5	42.3	46.5

TERRITORIAL											
Caribair	23,723	21,343	11.0	1,437	1,489	9.9	177,007	161,408	9.7	49.4	58.7
Hawaiian	32,533	34,064	-4.5	4,808	5,036	4.5	521,989	554,473	-5.9	58.6	58.4
Trans Pacific	16,744	14,731	13.8	2,239	2,140	4.6	187,757	167,943	11.8	58.9	54.8
TOTALS	73,020	70,138	4.1	8,684	8,665	.2	886,753	883,824	.3	59.9	57.8



SAM SAINT SAYS

On June 15 the first "positive (no-visual-flying-allowed) control" went into effect from 17,000 to 22,000 ft. on three of the nation's main-line, trans-continental airways. This may prove to have been the most significant forward step ever made in air traffic control.

The coming of positive control has always been inevitable—an inevitability predicted by this reporter as early as 1945. The need for positive-control is supported by the same simple logic that puts underpasses at railroad crossings. You want safety where speeds are high and traffic is dense; so you put up fences to keep uncontrolled traffic off the main-line tracks.

• The only answer—Positive control is the only solid answer to the air collision problem. Unfortunately, however, the nation's airways and air traffic system are not ready for widespread application of positive control. One major carrier reports an average cost of 44 extra minutes per round trip on coast-to-coast nonstops. Applying this figure across the board shows the trans-continental airlines already are paying more than \$5 million per year for this limited experimental use of positive control.

Under forced draft from mounting public opinion, the positive-control answer to the air collision hazard is snowballing into a controller's nightmare that is exasperating pilots, harassing passengers and will soon be ringing alarms in Wall Street.

• Need has been growing—For many years the need for positive control on our busy airways has been growing quietly, insistently, the hidden pressures below the surface increasing steadily toward inevitable volcanic explosion. For ten years committee after committee has attempted to state the need for positive control so preparation of control and airway facilities could get under way. Routinely these efforts were squelched by the negative attitude of certain military and private flying interests who saw positive control as a threat to their free use of the sky.

Finally, in 1955, a clear-cut demand for positive control boiled up by spontaneous combustion in the ranks of

Special Working Group 13 of the Air Coordinating Committee. Three top controllers of wide experience drafted words that were later adopted by the ACC—words that called for establishment of areas where positive control would always be in effect and where no visual flying would be allowed at all.

Then came the disastrous Grand Canyon accident. Public relations people, who had always blue-penciled any suggestion of airway hazards from public pronouncements, realized the blue pencil could no longer hide the true state of affairs.

• Belatedly, action—Congress and the aviation world were shocked into action. Money began to flow. The Airways Modernization Board was established by Congress in record time. CAA's radar and radio communications expansion programs were expanded in the evening and doubled again next morning. The airlines took a new and careful look at the nearly impossible concept of a proximity warning device.

And Capt. "JD" Smith, Chairman of ALPA's ATC Committee (with a near-perfect sense of timing and more inter-

tinal fortitude than most people realize) led the airline pilots and indirectly the airlines into the now successful "Golden Triangle" experiment.

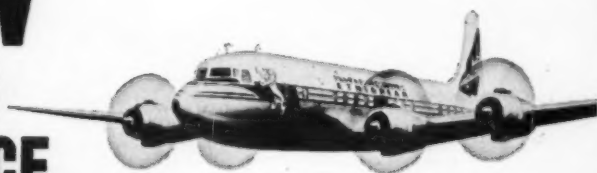
Then the rough coincidence of two midair collisions involving jets burst into headlines. CAB's Oscar Bakke, "facing the nation" with courage and commendable candor, started "positive control" on a basis that could hardly have been more logical.

• Public alarm excessive—As of now the public alarm far exceeds what the true situation merits.

It is true we need the attention from the public, the money from Congress, the all-out push on development to catch up, but there is an overriding need for a steady hand on the policy throttle. We need to get the public back on an even keel. We need to support CAB and CAA in their realistic implementation of positive control in step with the capability of the airways to handle traffic in this new and safer way.

And let's call in the "fire brigade" to work out some quick fixes for traffic bottled up on the three positive control airways now in being.

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Mach 3 jet transport and big turboprop freighter are reported planned by Lockheed. Reports are that the transport, available for commercial use in 1965 or 1966, would cruise at 80,000 ft., have range of 3,500 miles. Gross weight would be over 400,000 lbs. Lockheed confirmed that it has discussed plans for freighter with Flying Tiger Line and others. FTL said the plane would carry 65,000 lbs. payload and have an "amazing" 121% ratio of payload to aircraft weight (53,000 lbs.) Ton-mile operating cost was put at about 3¢, which would halve present airfreight rates to about 10¢ a ton-mile.

Conversion of Douglas DC-7s to turboprop power is being studied by several major airlines. Aircraft Supply Co., U.S. representative for D. Napier and Sons, is supporting the Eland conversion proposal with a vigorous sales program. It's understood Douglas will install the British engines in one DC-7 for test and demonstration purposes if firm interest is shown for a minimum of 30 conversions.

Cost of the job is estimated as \$1 million per plane but direct operating costs would be reduced from \$453.60 per hour with piston engines to \$439.98 with Elands. Average block speed would be increased from 300 mph to 350 mph.

First flight by mid-August is planned for Grumman's turboprop, the Gulfstream executive transport. This is Grumman's bid to re-enter the commercial market. Plane will undergo test program to obtain CAA 4b certification prior to delivery of first in 1959. Orders for 25 are on hand.

Leasing of ground-handling equipment by airlines has more than doubled in past 18 months. So says Clarence C. Kane, vice president of United States Leasing Corp., San Francisco, who adds that about \$6 million worth of ground equipment is now being leased. This frees larger amounts of working capital to finance new aircraft.

Public hearings in the General Passenger Fare Investigation may be over this week. Witnesses for the CAB Bureau of Air Operations have been contending—in the face of a slashing cross-examination by the carriers and the ATA counsel—that changes in air fares are directly reflected in the volume of traffic. There is some talk that the carriers will present

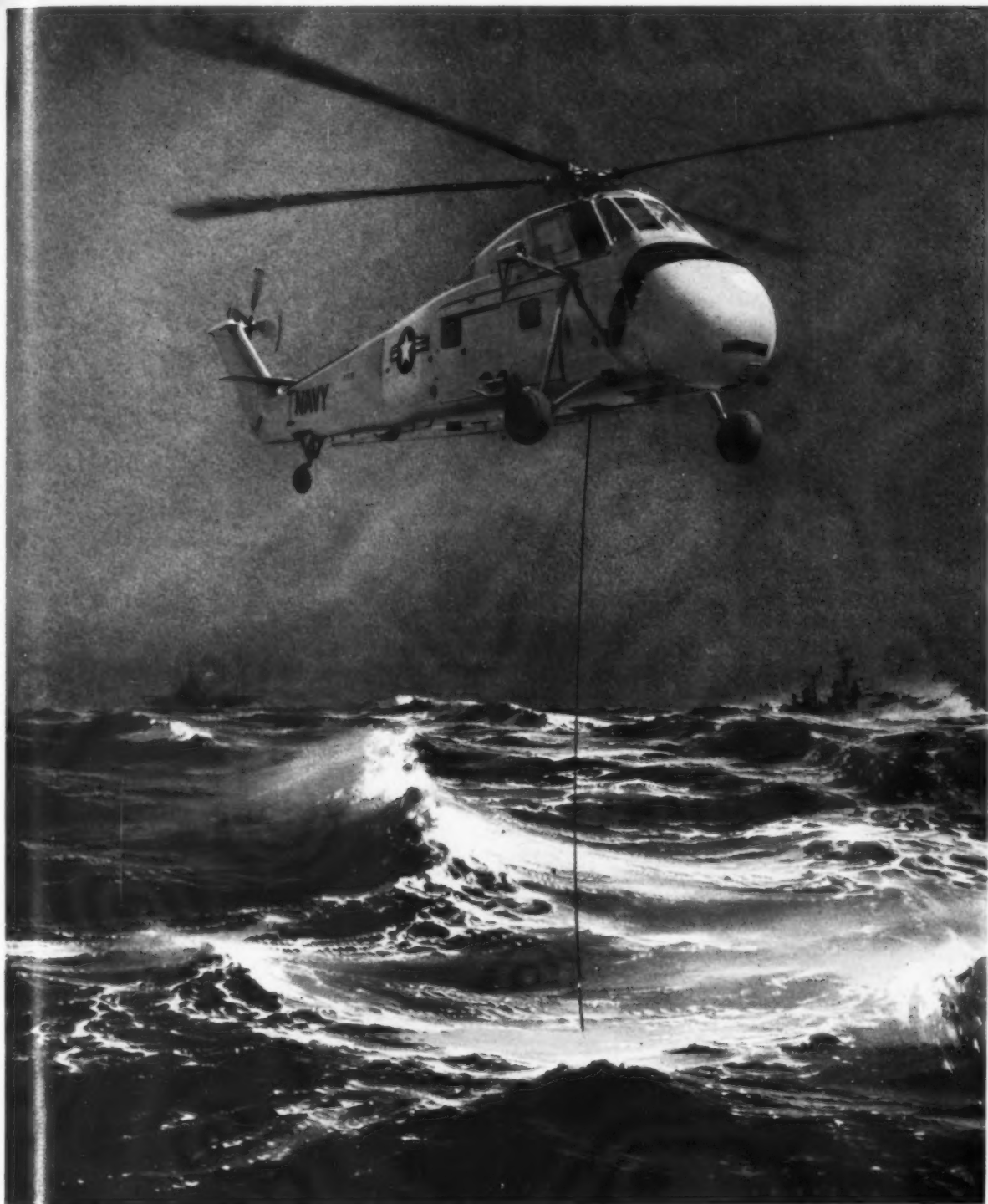
rebuttal testimony, but if they do it will further delay the investigation.

If there are no other witnesses after Bureau Counsel's, the hearing phase should end by July 31. August is traditionally the vacation month at the CAB, but the hearings are expected to continue without a recess if they run beyond August 1. Next step in the investigation will be Examiner Ralph Wiser's initial decision. Because of the many complicated issues in the investigation, this is not expected until late in the Fall. Then there will be exceptions filed by the carriers, oral argument before the Board, and finally—sometime next Spring—an opinion and order of the CAB.

Final decision in case linking Texas and California by additional air service must be postponed. The CAB last week opposed its hearing examiner and said, with Chairman Durfee and Vice Chairman Gurney dissenting, that final decision must be put off until Southern Transcontinental case comes up for decision.

Actually, though the press release decision didn't mention the fact, the famous "Ashbacher" court decision played a part in prompting the majority rule that Dallas-to-the-West issues could not be separated from the transcontinental case. Latest Board action means about a two-year delay in the case, but probably staved off a long and expensive court action. Meantime, Continental—recommended by the examiner for the Dallas-San Francisco & Los Angeles route—is thrown a bone in the form of additional nonstop authority along its Texas and New Mexico routes.

Expectation that Charles F. Willis, Jr., might become a controlling stockholder in Alaska Airlines when he was made president in May, 1957 has not been borne out so far. Latest report to stockholders shows Willis holding only 2,000 shares. Of 614,582 shares presently issued and outstanding, Raymond W. Marshall, together with his wife and a Marshall company, owns 242,795 shares, or approximately 40% of the total. When Willis joined Alaska from W.R. Grace & Co. he entered into an option agreement to purchase the Marshall shares, but this option has not been exercised.



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Forecast: Locals' Subsidy Bill Going Up



- \$15 million more to come by '61
- Congressional support is strong
- 7-States Case may add \$5 million

By Donald J. Frederick
CAB Editor

Nearly \$15 million will be added to the nation's subsidy bill for local service airlines within the next two or three years—approximately half again the \$29.7 million Congress has appropriated for fiscal 1959.

Ten years ago, the carriers received 66% of their total income from subsidy. Last year, the percentage was only 36% of total income. But it is clear that the industry's subsidy "temperature" stands to rise substantially in the very near future.

The first and most significant symptom is the large epidemic of current Civil Aeronautics Board area cases. Eleven proceedings are now in varying stages of development (see accompanying chart), and they will account for the lion's share of the increased subsidy bill.

These cases are likely to result in a \$9.9 million subsidy jump. The Seven States Area Case will account for the biggest bill, an estimated \$5 million. In this case, 56 cities received local service and three airlines were awarded nearly 8,000 new route miles. Of this total, 25 communities obtained airline service for the first time.

The 10 remaining cases, now in varying stages of development, should account for roughly \$4.9 million in subsidy. This figure is based on an average of estimates by CAB's Bureau of Air Operations in the Great Lakes Local Service Area Case, Pacific Northwest Local Service Case, and the Southeastern States Area Case multiplied by ten.

• **Congressional support is strong**—The local service area investigation has attracted strong congressional support because Congressmen often have a hard time explaining lack of local air service to constituents.

Congressional support is most in evidence during the final stage of an area case. Delegations of legislators inevitably appear to argue the community cause for adequate air service. A group of 17 congressmen opened the Seven States Case while a battery of nine lawmakers began oral argument in the

Case	Local Airlines Involved	Status
1. Seven States Local Service Area Investigation (Docket 7454)	Central, North Central, Ozark	Press release decision issued May 19.
2. Pacific Northwest Local Service Case (Docket 5463 et al)	Bonanza, Pacific, West Coast	Oral argument scheduled July 30.
3. Montana Area Case (Docket 6293 et al)	Frontier, West Coast	Hearing concluded May 29, 1957. Examiner's decision issued July 9.
4. Great Lakes Local Service Area Case (Docket 4251 et al)	Allegheny, Lake Central, Piedmont, Mohawk	Hearing concluded October 3, 1957. Examiner's decision pending.
5. Northeastern States Area Investigation (Docket 7436 et al)	Allegheny, Mohawk	Hearing concluded January 16. Examiner's decision pending.
6. South Central Area Case (Docket 7939 et al)	Trans Texas, Southern	Oral argument held May 21. Submitted to the Board for decision.
7. Southeastern States Area Case (Docket 7038 et al)	Southern, Trans Texas	Hearing concluded March 7. Expedited Defense Department portion of case awaiting oral argument before CAB.
8. Kansas-Oklahoma Local Service Case (Docket 5482 et al)	Ozark, Trans Texas, Central	Hearing set to open July 15.
9. Piedmont Local Service Area Investigation (Docket 5713 et al)	Allegheny, Lake Central, Southern Ozark, Piedmont, Trans Texas	Procedural dates temporarily suspended.
10. Pacific Southwest Local Air Service Case (Docket 5645 et al)	Pacific, Bonanza, West Coast	Prehearing Conference held June 5. Awaits hearing.
11. Kanab-Page-Glen Canyon Area Investigation (Docket 9185 et al)	Frontier, Bonanza	Hearing concluded April 29, Awaits examiner's initial decision.

South Central Local Service Area Case.

CAB Chairman James R. Durfee has repeatedly reminded local-service-minded legislators that they should be prepared to vote for the increased appropriations which are required to provide the service they seek. And in the press release decision announcing the Seven States case the whole Board commented that "the spread of local service has the clear approval of the public expressed through members of Congress and state and civic leaders who have appeared before the Board in this and other cases."

Two years ago, in the Panama City-Atlanta Investigation, the Board also showed a willingness to loosen the purse strings for worthy local-service operations. In that case, the Board said "it is not essential that we find that the operation will immediately produce a profit or a subsidy reduction . . . indeed, if this were necessary . . . we would be obliged in virtually all cases to favor trunkline applicants over local service carriers."

The subsidy impact of these local service proceedings has probably been underestimated, since the service needs of areas such as Texas, the southern half of Oklahoma and Colorado, New Mexico, and part of Arizona have not yet been considered.

• Equipment transfusion needed—Just around the corner is a second factor which should boost the subsidy requirement substantially—the necessity for an equipment transfusion. Local airlines are faced with the problem of replacing the pre-war DC-3 work-horse. The urgent need for a more efficient short-haul aircraft and the desire for economic self sufficiency justify this course of action. In fact, most airlines contend that as long as the DC-3 flies the airways, there will always be subsidy payments.

The transfusion is going to cost money and lots of it. Dollars will have to close the gap between traffic and capacity.

Assuming that 10 local airlines embark on re-equipment programs in the reasonably near future, the average subsidy hike per carrier could well be in the neighborhood of \$500,000. Total bill for the whole re-equipment operation would then equal \$5 million.

Recent developments foreshadow this quick re-equipment trend. A Bonanza Air Lines loan has already been approved; Pacific Air Lines has submitted economic data to CAB for a loan; Piedmont Airlines has already filed; and West Coast Airlines has managed to finance its own equipment program. At

least two other carriers are in the serious rumor stage.

Prediction of a \$5-million bill for the equipment transfusion might be conservative. The F-27, despite optimistic reports, remains an unknown quantity. Best preliminary estimates indicate optimum results at longer stage lengths. To maintain subsidy-free operations, the DC-3 requires an 89% load factor during an 80-mile hop. The F-27 will need 76%. On a 150-mile hop, the DC-3 requires 84%, but the F-27 can stay subsidy-free at 65%.

Cost per mile figures are even more revealing. These estimates, based on present traffic levels of 10.1 passengers per plane, show that the DC-3, while flying an 80-mile hop, costs \$1.21 (DC-3 costs reflect estimates of return on investment and taxes) per revenue plane-mile, the F-27, \$1.58. These costs decline on the 150-mile hop to \$1.40 for the F-27 and \$1.17 for the DC-3.

• Guaranteed loans should help—The plasma designed to facilitate this intricate transfusion is the Guaranteed Loan Law enacted by Congress last September. This statute, designated Public Law 85-307, enables CAB to guarantee loans for the purchase of

aircraft up to \$5 million to any local or territorial airline. The guarantee may not exceed more than 90% of the loan while the loan itself may not exceed more than 90% of the purchase price of the equipment.

Once the Board approves X airline's equipment program through the vehicle of the guaranteed loan, it would seem to be in effect prejudging the equipment favorably. Responsibility for the subsidy bill will then rest with CAB.

A third subsidy factor, the germ of inflation, has attacked the local service carriers as it has their big brothers, the trunks. The subsidy bill might well have been affected to the tune of \$2 million yearly until CAB applied a temporary antibiotic labeled "The Interim Passenger Fare Increase." This shot-in-the-arm has proved a more effective deterrent to inflation fever in the local service industry. A fare increase which amounted to 6.6%, plus \$1 per ticket for the trunks, means more to the local carriers with their shorter hauls.

On the basis of present trends, the local carriers will probably reach the subsidy peak somewhere around 1960-1961. However, the same factors which forced them to climb should make the descent much easier.



Northeast Airlines Buys Nine Viscounts

An order for nine Viscounts, plus an option on a 10th, has been placed by Northeast Airlines with Vickers-Armstrongs. First two planes will be placed in service about Aug. 21, with the remainder following over a four-month period. The purchase, almost \$15 million including spares, is being financed by an equipment trust agreement with Vickers and Rolls-Royce. Irving Trust Co. of New York is the trustee. The first Viscounts will go on routes now served by Convairs—from Boston to such points as Montreal, New York,

Philadelphia and Washington. In September NEA plans to put them into service from New York, Philadelphia, and Washington to Jacksonville, and beyond Jacksonville to Miami or Tampa. The planes, Model 745D, were among 15 originally optioned by Capital Airlines. The option was never exercised. It was revealed last month that NEA had been unable to arrange financing for purchase of five Bristol Britannia turboprops. The company will try to complete plans later this year for purchase of jets.

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CHA—Short on Distance, Long on Future

By Eric Bramley
Chief News Editor

CHICAGO—We took off in a Chicago Helicopter Airways S-58 from Meigs Field, on the lakefront near the Loop. Past the window went the Wrigley Building, Prudential Building and other familiar sights. And in a quick 11 minutes we landed at O'Hare Field, 17 air miles out on the northwest side.

There was a two-minute stop while passengers deplaned and enplaned. And in another 11 minutes the single-engine Sikorsky sat down at the end of a finger at Midway Airport on the southside.

To one who has spent hours bucking Chicago street traffic, this was living. It's the ideal way to get around this sprawling city.

That others share this opinion is seen in CHA's phenomenal growth during the past several months. In 1957, it carried 55,314 passengers. This year it fully expects to double this figure with its five 12-passenger S-58s.

And if the first six months are any indication, this goal may be exceeded substantially. The first half of 1957 produced 15,471 passengers, while the same 1958 period totaled 47,860.

• **Other signs of growth**—CHA carried its 100,000th passenger on June 18, 1958, a little over 19 months after

starting passenger service. It expects to haul the second 100,000 by next June and reach 250,000 before the end of 1959.

CHA's principal passenger operation is around the "triangle"—Meigs to O'Hare, O'Hare-Midway and Midway-Meigs. Three months ago it opened service from Midway Airport to Gary, Ind., and on July 7 added a route from O'Hare to Winnetka, wealthy community on the lake north of Chicago.

In addition, CHA has three all-mail routes fanning out from the airports, serving 49 suburbs through 31 heliports. These routes are operated with three Bell 47Gs.

The company now flies 36,000 miles a month in passenger service, 24,000 with mail. It has 101 passenger flights per day, offering 1,212 seats. There are nine daily mail flights—morning, noon and evening service around each of the three routes. Last year, more than one million pounds of mail were carried.

CHA's passenger load factor in May was 40%, dropping to 35.6% in June and averaging 35.7% for the first six months of 1958.

Its best month was May, with 9,735 passengers. June figures dropped to 9,041, with the decrease attributed to bad weather. July may be the first month in which more than 10,000 passengers will be carried.

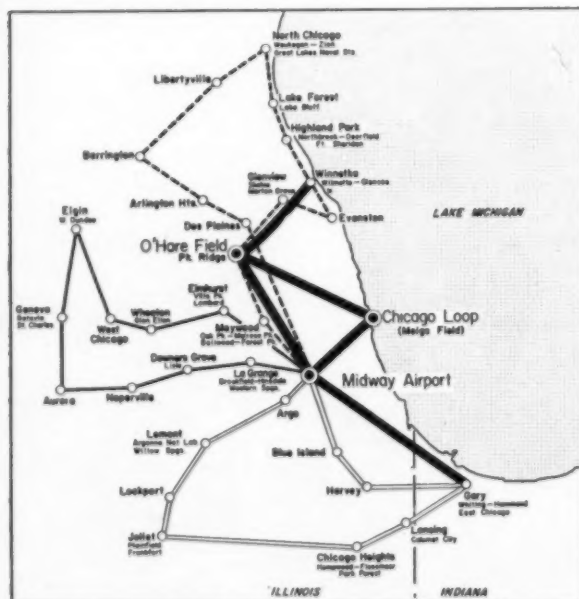
The company started in 1949 as

Helicopter Air Service, headed by Hamil Reidy. It opened suburban mail service on Aug. 20, 1949, from Midway to the roof of the main Chicago post office, using three Bell 47s (the fleet was later built to six). At that time it had a three-year experimental certificate but later extensions carried this through to 1956. Passenger rights were then granted and its present certificate expires on Aug. 6, 1963.

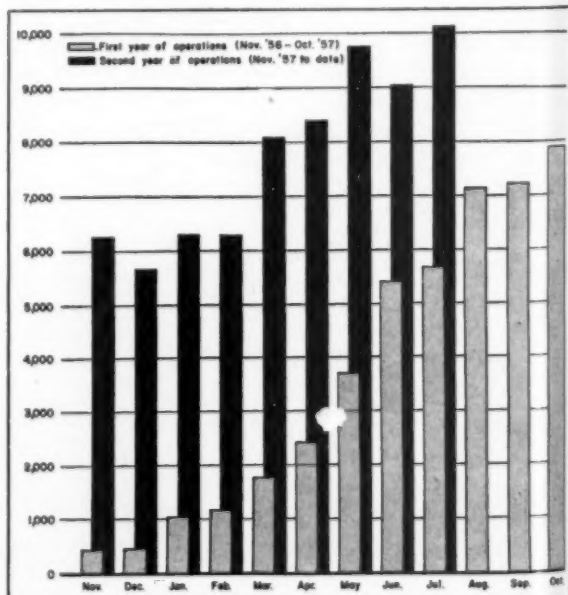
In 1955 control of the company was purchased by a group headed by John S. Gleason Jr., Chicago banker and this year's national commander of the American Legion, who is new president. Figuring prominently in the management is C. W. "Wes" Moore, executive vice president, who has been with the organization since its inception.

When passenger operations started on Nov. 12, 1956 (Midway-O'Hare)—the same year in which the company's name was changed—CHA was flying seven-passenger Sikorsky S-55s, of which it eventually owned three. By July, 1957, it had its first S-58 in service and the complete switchover to this equipment was accomplished June 1, 1958. Originally, CHA was to get three S-58s but has ended up with five when Sikorsky gave it two more in exchange for three S-55s.

• **High fares don't discourage public**—Fares are high when compared with



CHA's OPERATIONS consist of passenger service to five points (heavy black line) plus three all-mail routes.



RAPID GROWTH of Chicago Helicopter Airways' passenger traffic is shown on the above chart. July, 1958, total is estimated.

airport coach charges. But the public is willing to pay to save time and to avoid the exasperating surface transport conditions. Meigs-O'Hare fare is \$6 plus tax for the 11-minute flight. Surface coach is \$2.25 and takes 80 minutes in the rush hour. Meigs-Midway, nine minutes, is \$5 plus tax, compared with \$1.45 and 75 minutes. O'Hare-Midway cost \$6 plus tax for 11 minutes, against \$2.50 and 75 minutes. Incidentally, if you take a taxi from O'Hare to Midway, you'll pay \$8 to \$9.

Originally, CHA's fare was \$5 for any leg of the triangle, but two segments were upped to \$6 on May 1. The increase had no adverse effect on traffic.

To promote its sales, CHA has concentrated on two things: 1. Informing the airlines of the advantages their passengers can enjoy by using the helicopter; 2. Making certain that its own 125 employees are service-minded. These campaigns have paid off. The other airlines are selling CHA enthusiastically. CHA's employees seem to take pride in the job they do and their enthusiasm rubs off on the passengers.

Adding greatly to the saleability of its service is the fact that CHA will ticket an interline passenger all the way through to final destination and will check his baggage through. Thus, the passenger doesn't have to lug bags around congested Midway. The airlines in turn ticket on CHA.

The company has made efforts to obtain a downtown Chicago heliport, but so far has not been successful. This is not considered too much of a disadvantage, with Meigs only 8-10 minutes from downtown. If plans ever go through for an airlines terminal near the Loop, provision is expected to be made for a rooftop heliport.

CHA does not pay for use of heliports on its mail routes, although it handles their maintenance. Land on which the heliports are located is owned by companies, communities or individuals who permit its use as a public service.

Standard passenger weights and baggage weights are used by the carrier to speed the loading of its helicopters. Airlines use standard passenger weights, but add up the actual baggage weights to figure the load going aboard the airplane. CHA weighs baggage at the counter only to determine if there is excess. The company assumes that each bag weighs the maximum of 40 lbs. This is possible because excess payload is available.

A full load of 12 passengers, each weighing the winter average of 180 lbs. (170 lbs. in summer), and 12 bags

at 40 lbs. each would total 2,640 lbs. There are 2,660 lbs. available.

Noticeable in the CHA operation is the fact that its helicopters do not take off and land vertically at the three airports. Rather, they make short landing and takeoff runs. The reason, says Bob Angstadt, vice president-operations, is to keep rotor blast away from buildings. Vertical operations near buildings where people might be standing "just isn't good taste," he adds. CHA's procedures also have the advantage of pulling less power from the engines.

Daytime operating minimums for passenger flights are 500 ft. and one mile, with 300 ft. and half a mile allowed on the mail routes. Nighttime passenger minimum is 1,000 ft. and two miles. There are no instrument operations.

The five S-58s are now operating a total of about 18 hrs. 50 mins. a day (this is the time for the entire fleet, whether operating, in overhaul or on standby). While this is a low average, Angstadt cautions that "rotor time" rather than flight time is a better index of use. This would include a couple of minutes to crank up the engine, and a couple of minutes for clearance and taxiing. Thus, on a trip completely around the triangle, the 31 minutes actual flight time might be only 70% to 80% of rotor time.

• Pilots members of ALPA—CHA's 26 pilots and copilots (two-man crews are used on the S-58s, one pilot on the Bells) are members of Air Line Pilots Association and have a contract similar to fixed wing operators. They receive base pay, plus compensation for such items as gross weight, flight time and mileage. Most of them fly close to 85 hours a month and CHA says that pay is about the same as that of DC-3 crews.

The Wright R-1820 engines in the S-58s are overhauled (at 600 hrs.) by Curtiss-Wright. In addition, radios, instruments and some hydraulic components go to outside overhaul facilities.

Main rotor blades are overhauled "on condition" and so far the company has had to replace only two blades. Other S-58 overhaul times: rotor head assembly, 500 hrs.; tail rotor assembly, 600 hrs.; main gearbox, 500 hrs.; tail gearbox, 600 hrs.; main drive shaft, 600 hrs.; most hydraulic components, 1,200 hrs.; fuselage, 3,000 hrs.

• Still unprofitable operation—With its traffic volume, is CHA making money? The answer is no and this answer will apply until a more economical helicopter is available. In 1957, the company's subsidy totaled \$1,091,834, passenger

revenue was \$276,016 and mail pay was \$68,236. This year, passenger revenue will top \$500,000.

The economics of the operation can be seen from the following: CHA's yield per passenger-mile is 32.24¢. But with present load factor, it costs 83.9¢ (39.9¢ direct expense and 44¢ indirect) to produce the seat that was filled at 32.34¢. Put another way, in the first quarter of 1958 direct expense per available seat-mile was 20.3¢, indirect was 16.2¢, for a total of 36.5¢—a figure, incidentally, of which the company is proud. Revenue per available seat-mile was about 12.9¢. In May, if CHA had carried 16,700 passengers instead of 9,735, it would have covered its direct costs.

To improve the company's position, its officials say that two steps are necessary: 1. Increase the present load factor to at least cover direct operating costs. 2. Increase utilization and fill the new seats that will be available. Ideally, they add, schedules should be operated every 10-15 minutes.

The next helicopter (no decisions have been made on further purchases) will be a larger, faster, twin-engined turbine-powered model with lower seat-mile costs. There is even some opinion that two types may be needed: 1. A large fast craft for use on suburban routes. 2. A smaller model for the triangle, where frequency is much more important than capacity or speed.

It seems unlikely that CHA will plan any further expansion of passenger routes until it has had considerable experience with the new operations to Gary and Winnetka. These two routes give it a chance to analyze entirely different communities. Gary is the center of the Calumet industrial area. Winnetka is a suburban residential community on the north shore (of all Chicago suburban areas, the north shore produces the most airline passengers).

When the time comes to expand, CHA has the authority. Its CAB certificate permits service to any community within a 60-mile radius of O'Hare.

CHA is optimistic about the future. Chicago plans expressways that will make it easier to reach the airports, but by the time these roads are completed in the 1960s, CHA expects to have faster equipment and a fare that is more competitive with ground transport.

As for the immediate future, C. E. Liske, traffic and sales manager, comments: "In a few months, a passenger on a jet transport from New York will arrive at O'Hare in 90 minutes. Who's going to want to spend another 75 minutes getting downtown?"



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Agency—Lubell Advertising Associates	
Lockheed Aircraft Corp.	17
Agency—Foote, Cone & Belding	
McDonnell Aircraft Corp.	31
D. Napier & Son, Ltd.	11
Agency—C. R. Casson, Ltd.	
National Aeronautical Corp. (NARCO)	37
Agency—Davis, Parsons & Strohmeier, Inc.	
Nuclear Products, Erco Div., ACF Industries, Inc.	28
Agency—Conti Advertising Agency, Inc.	
Puritan Compressed Gas Corp.	37
Agency—Rogers & Smith Advertising Agents, Inc.	
Rohr Aircraft Corp.	58
Agency—Barnes Chase	
TECO, Inc. (Transport Equipment Co.)	40
Agency—Jaycraft Co.	
Texas Company, The	64
Agency—G. M. Basford Co.	
United Air Lines, Inc.	48
Agency—N. W. Ayer & Son, Inc.	
Vickers-Armstrongs (Aircraft) Ltd.	36
Agency—McCann-Erickson, Inc.	
Warner Lewis Co., Div. of Fram Corp.	8
Agency—Paul Locke Advertising, Inc.	
Wilcox Electric Co.	2
Agency—Valentine-Radford Advertising	

THE BULLETIN BOARD

Undisplayed Advertising: \$2.00 per line, minimum charge \$6.00.
Cash with order. Estimate 30 capital letters and spaces per line;
40 small lower-case letters and spaces per line. Add two lines if
Box Number is included in lieu of advertiser's name and address.
Displayed Advertising: \$20.00 per column inch. Space units up to

full page accepted in this section for classified-type advertising.
Forms close three weeks preceding date of issue. Address all cor-
respondence to Classified Advertising Department, American
Aviation Publications, 1001 Vermont Ave., N.W., Washington
5, D.C.

Help Wanted

PURCHASING AGENT EXPERIENCE

Aircraft Parts—Airline experience desir-
able, but not mandatory. Forward re-
sume stating salary requirements to

BONANZA AIR LINES

Box 391 Las Vegas, Nevada

Situations Wanted

BONN Companies interested in obtaining
current first-hand information on sales op-
portunities in West Germany are invited to
write to BOX 161, American Aviation Maga-
zine, 1001 Vermont Ave., N.W., Washington
5, D.C. A German aircraft expert with valu-
able connections in Government and indus-
try desires to represent a progressive com-
pany working in the aircraft or related
fields. Being at present in North America,
a personal interview, without obligation,
can be arranged.

For Sale

SUPPORT EQUIPMENT—BARGAINS
AIR CONDITIONING TRUCK
Designed for DC-6 Cooling and Heating
AIR CONDITIONING TRAILER
Designed for DC-6 Cooling, 440V Input
BUDA HA 120 SHOP MULE
1 EA. 500 AND 750 AMP 28 VDC
TRANSFORMER RECTIFIER UNITS
440V Input—Trailer Mounted
GREMCO, INC.
P. O. Box 7115, FT. WORTH, TEXAS

INVESTOR—Interested in airport, air-
plane distributorship, airplane manu-
facturer, etc. Include all past data and
future possibilities in first reply. Write
Box 159, AMERICAN AVIATION
Magazine, 1001 Vermont Ave., N.W.,
Washington 5, D.C.

PILOTS WANTED—Must have com-
mercial S&MEL Instrument and A&E
license with a minimum flying time of
approximately 1250 to 2000 hours.
Contact Personnel Department, Gulf
States Utilities Company, P.O. Box
2951, Beaumont, Texas.

THE
SKYMOTIVE
STORY
Complete . . . YES
COMPLETE
AIRCRAFT SERVICES
skymotive
O'HARE FIELD CHICAGO

FOR SALE

1. Iron Fireman heavy oil burner, com-
plete with controls. Model 016,
group IV, good condition—1
Assessed value \$150.00
2. RCOC remote control oil switch,
120V, capacity 15A at 7500V. New
condition—5
Assessed value \$100.00 each
3. Westinghouse regulating trans-
former, line voltage 3300-3000 V;
constant current 6.6 A. New condi-
tion—1
Assessed value \$80.00
4. Westinghouse transformer, Type S,
3300 V, 3300-3135-2970, voltage to
32 V; 5K-V-A. Good condition—2
Assessed value \$30.00 each
5. Westinghouse Flood Lights, 26"
Diam., 32 V, Poor condition—2
Assessed value \$5.00 each
6. Grouse-Hinds Airport Control Desk,
No. 44109, incomplete fair condi-
tion, with associated wind equip-
ment in good condition—1
Assessed value \$200.00

The above described equipment can
be inspected at the Missoula County
Airport, Missoula, Montana. All bids
should be submitted to the Airport
Manager, Missoula County Airport,
Missoula, Montana. No bids with
less than 90% of the assessed value
will be considered.

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immediate delivery from world's largest shelf stock.
Buy direct from manufacturer. Lower prices—
quicker service. Send for free wall charts showing
complete line of AN & MS fittings and hard-
ware. We machine parts to your own print; also,
we sell AN & MS Forgings.
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craft Co. to latest Learstar specifications.

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Auto-Pilot & Gyroscop Compass, Complete Systems
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Overseas & Domestic
Financing Available

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Telephone YUkon 4-6685
Cable: USOALINES NEW YORK
TWX NY 1-3486

SIDELIGHTS

• **Dangerous game**—A recent check
of some of Eastern Air Lines airplanes
used on over-water routes disclosed
that some of the company's good, in-
flatable life jackets had been removed
from seat pockets and replaced with
cheaper, kapok-type jackets from South
America. How it happened, no one
knows yet, but EAL is checking it out
thoroughly. If pilfering is involved,
each theft of a jacket could be the
same as stealing a life.

• **That's a lotta bucks**—A modern
interceptor "costs a couple of mega-
bucks," figures Dr. Charles S. Draper,
director of MIT's flight facilities. And,
he says: "The Wright Brothers air-
plane and first flight cost \$3,000, in-
cluding transportation. Today you
can't even pay your telephone bill to
negotiate a contract for that amount
of money."

• **Add 'What's-in-a-name' items**—NO-

ALA is not, as the word might suggest,
the name of some shapely, sloe-eyed
exotic dancer, nor is it the code name
for an equally exciting classified project.

Prosaic but practical, NOALA has
been identified as an automatic sound
level system that kicks up public address
system volume in relation to shop noise
or to make the paging heard during jet
takeoffs. It stands for NORTH American-
Los Angeles, where the device is in-
stalled.



Passports, Plumbing, People and Pictures

Just for the Record: Passports

Two days after Ed Murrow and his Person-to-Person cameras visited my house in Washington, during which program I mentioned that I possessed U.S. Passport No. 2 (thanks to having a wife who is director of the passport office), *This Week* magazine, which is distributed with many Sunday newspapers, carried an item which in effect called me a liar.

A column in *This Week* called "Quiz 'Em" by Tom Henry answered a question, "Who holds U.S. Passport No. 1?" as follows: "Although it's usually held by the Secretary of State, Mr. Dulles decided his wife should have it. He took No. 2."

I queried Mr. Henry, who replied with profuse apologies. What he meant to write was that Mr. Dulles and his wife always use *diplomatic* passports and of course he can have any number he wants in this restricted category. (The President needs no passport.) But as regards the common herd of citizens, I'm holding firm to my No. 2 regular passport. A college professor was given No. 1 when the serial numbers were changed several years ago.

Recognition for the "Bee-Day"

As you older readers of this page will recall, I'm a crusader and advocate for that versatile French plumbing fixture called the bidet (pronounced bee-day). I think every household should have one, but although every U.S. plumbing fixture outfit manufactures them as standard items (in colors, too), they never get advertised or prominently displayed. (There's supposed to be something sinful about them.)

I'm happy to report, however, that Gerber Plumbing Fixtures Corp., Chicago, has broken the ice. It advertised

bidets in a full page illustrated ad in *Good Housekeeping* for May. And thanks to Jerome T. Condon, district passenger service manager for TWA at Peoria, Ill., for tipping me off.

"Even if used at first to wash the feet—or to store the goldfish while cleaning the fishbowl—I'm as sure as you are that our fellow Americans will eventually realize the wisdom of installing bidets in our bathrooms," says brother Condon. To which I add: Amen.

Courtesy and a Credit Card

Now to catch up on a bale of notes:

Last fall I made one of my periodic trips to Los Angeles. A few days before returning to Washington I missed my Diner's Club credit card. I hunted high and low for it. I decided to report the loss when I got back to the office.

No sooner back, however, than arrives a letter enclosing the card. It read: "I am enclosing your Diner's Club card, which I found at Marineland Park. After reading your descriptions of your travels and luncheons in various parts of the globe I know that you must certainly have missed this card." It was signed by Murray L. Frank of West Los Angeles.

Now partners, that's real neighborliness. Seems that I had driven out to Marineland, a wonderful tourist attraction out there, with Per A. Norlin, former president of Scandinavian Airlines System, who happened to be on the West Coast at that time. Somehow or other, I had lost the Diner's Club card. The place was crowded with visitors, but by one of those coincidences which makes the world go round, the person who picked up the card has been reading this En Route page. Needless to say I rushed a hearty thanks to Mr. Frank, who I assume works somewhere in the aviation business.

New Zealand Photos



Leo White photos

WWP POSES with Capt. J. J. Busch, general manager of New Zealand National Airways Corp. in the airline offices.



D. A. PATTERSON, assistant to general manager, NZNAC, welcomes WWP at Wellington on 1957 trip—the series which concluded last issue.



VIEW AND ADIEU—At left is the southernmost city in the British Commonwealth—Invercargill, N.Z. At right before departure from Whenuapai airport, Auckland. Mrs. Leo White,



WWP, Mrs. Iris Hunt (Hunt's Travel Service, Suva, Fiji Islands), Gavin Grocott (dist. mgr., NZNAC, Auckland) and Robert Allender (publicity mgr., Tasman Empire Airways Ltd.).

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photos
Busch,
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offices.



general
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Robert

ATION



Avco's honeycomb "sandwich" takes pounds off

flying weight. Crosley's honeycombing process is used to build air frames and missile components.

After the stainless-steel or aluminum honeycomb is shaped, two metal skins are fitted and joined to it.

The resulting metal "sandwich" provides a structure of maximum strength, extremely light in weight.

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THOMPSON AND TEXACO



TEXACO HONORS ONE OF ITS OLDEST DEALERS with this plaque and a gold watch. Carl Hellberg, Thompson Flying Service General Manager (left) is shown accepting this plaque from E. C. Treseder, Texaco Representative, Butte Division.

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and the finest products**

Thompson Flying Service, Salt Lake City, Utah, has sold Texaco aviation products enthusiastically for 30 years. It's one of the oldest Texaco dealerships in the country, founded by "Tommy" Thompson, one of aviation's pioneer flyers. A record like this is based on a lot of satisfied customers—people who appreciate Thompson's thorough service, and the dependable performance they get with Texaco fuels and lubricants in their aircraft.

Thompson Flying Service chose Texaco because they know airplanes and flying—and that Texaco products are the best way to keep ahead of the increasing demands of modern equipment. Texaco quality is so well known in the aviation industry, in fact, that *during the last 23 years, more scheduled revenue airline miles in the U. S. have been flown with Texaco Aircraft Engine Oil than with all other brands combined.*

Your Texaco Aviation Representative will be glad to explain the many advantages of handling Texaco Aviation products. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, *Aviation Sales Department*, 135 East 42nd Street, New York 17, N. Y.



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THE AVIATION INDUSTRY**